



EDUCATION OF MINING ENGINEERS AT THE TECHNICAL FACULTY IN BOR

Expert Paper
DOI: 10.5937/RGD240040S

Stajić Milan, Ivaz Jelena, Petrović Dejan, Radovanović Mladen

Technical Faculty Bor, University of Belgrade, Bor, Serbia
mstajic@tfbor.bg.ac.rs

Abstract: *Mining in eastern Serbia dates back to the Vinča culture period. The expansion of mining in the Republic of Serbia in recent years has contributed to the increased demand for highly educated staff in the field of mining. The leading provider of education for mining engineers in Eastern Serbia is the University of Belgrade, Technical Faculty in Bor. The Technical Faculty in Bor is a higher education institution that organizes accredited classes in the field of mining for three levels of study: Undergraduate Academic Studies (Bachelor), Master Academic Studies and Doctoral Academic Studies. This article shows a statistical overview of the number of students who have enrolled in and graduated from the Mining Engineering program.*

After completing Undergraduate Academic Studies (Bachelor) in mining engineering, students obtain the title of BSc in Mining Engineering. In the previous 10 years, from 2014 to 2024, 292 students enrolled in the Mining Engineering program and 122 graduated.

After completing the Master Academic Studies in mining engineering, candidates obtain the title of MSc in Mining Engineering. In the previous 10 years, from 2014 to 2024, 138 students enrolled in the Mining Engineering program (MAS), and 49 students completed Master Academic Studies.

Key words: MINING, EDUCATION, EAST SERBIA

INTRODUCTION

Technical faculty in Bor was established in the year 1961 as the Mining-metallurgical faculty with two departments – Mining and Metallurgy. The faculty belongs to the University of Belgrade, the oldest, the biggest and the most prestigious state university in Serbia [1, 2].

In 2005 the reform of academic education was done in Serbia according to the principles of Bolonia declaration. By new law on academic education, the education load of students is defined as ECTS (European Credits Transfer System) and academic studies were classified into three levels: Basic, Graduate-master and Doctoral [1].

In 2008 the faculty applied for accreditation for academic study programs (curriculums): Mining engineering, Metallurgical engineering, Technological engineering and Engineering management. All the curriculums are adjusted with the Bolonia declaration [1].

In 2007 the faculty was accredited as a scientific-research organization in technical-technological science. Postgraduate studies have been maintained at this faculty since academic year 1974/75 as specialist, master and doctoral studies [1].

At foundation the faculty was in the building of the mentioned French cassino. After some years several new buildings were cbuilt, thus today the faculty premises have available over 6000 m² [1].

The education process on Technical Faculty in Bor is realized on the following study programs, accredited in 2020:

- Mining engineering (1st, 2nd and 3rd level of studies continued from 1961);
- Metallurgical engineering (1st, 2nd and 3rd level of studies continued from 1961);
- Technological engineering (1st, 2nd and 3rd level of studies continued from 1978);
- Engineering management (1st, 2nd and 3rd level of studies continued from 2002);
- A part of enrolled students is financed from the budget of the Republic of Serbia while the rest of students pay studies by themself. (Technical faculty in Bor, 2021).

The mining engineering study program has three modules, namely:

- Exploitation of Mineral Deposits;
- Mineral Processing;
- Recycling Technologies and Sustainable Development.

EXPERIMENTAL

Due to the increase in the volume of work in the mining industry in the Republic of Serbia, it is important that the faculties that train staff for the industry have to offer enough staff.

This paper will analyze the enrollment and the number of graduating students of mining engineering at the Technical Faculty in Bor in the previous 10 years, this year's enrollment was not considered because it is still ongoing.

Also, only undergraduate and master academic studies will be taken for analysis.

RESULTS AND DISCUSSION

All data for this paper were taken from the student service of the Technical Faculty in Bor.

Table 1 shows the number of enrolled and graduated students in undergraduate academic studies.

Table 1, Number of enrolled and graduated students by school years (Undergraduate Academic Studies)

Number of students	School year									
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Enrolled	40	40	35	32	33	16	28	19	28	21
Graduated	3	18	16	12	14	10	14	16	15	4

The maximum number of enrolled students is 40, of which 32 are on the budget of the Republic of Serbia and 8 are self-financed.

Figure 1 shows a graph showing the number of enrolled and graduated students.

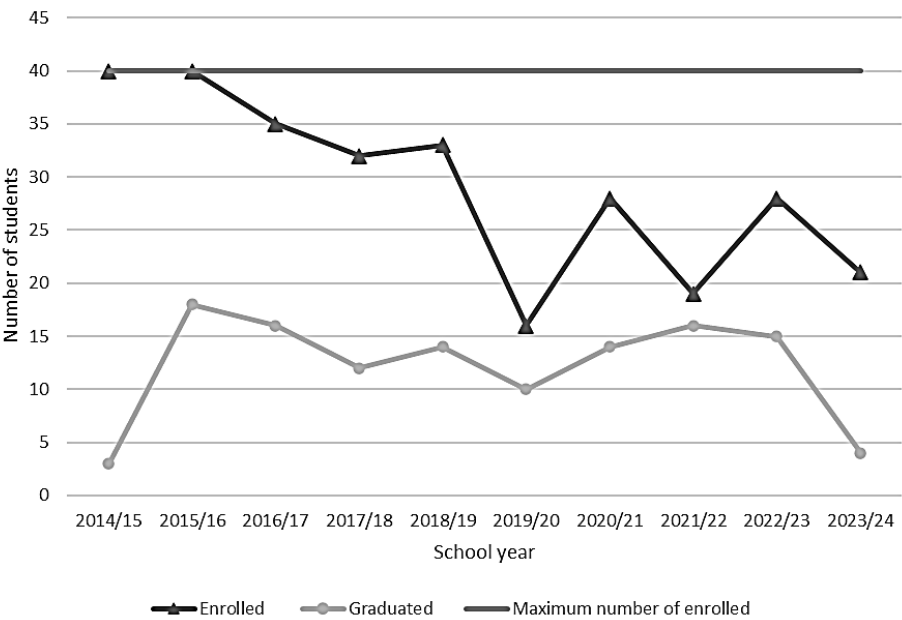


Figure 1, Graph of the number of enrolled and graduated students (Undergraduate Academic Studies)

The graphic shows that the number of students in the 2019/20 school year is dropping sharply, one of the potential causes of the drop is the arrival of the company ZiJin, which employed a large number of high school graduates. In recent years, the number of

students coming from the Technical school Bor, which educates mining technicians, has been very small [3].

Table 2 shows the number of graduate students classified according to the module of the mining engineering study program.

Table 2, Number of graduate students classified by module in the mining engineering study program

Mining Engineering - modules (Undergraduate Academic Studies)	School year									
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Exploitation of Mineral Deposits	1	9	8	8	9	7	7	15	6	2
Mineral Processing	/	1	6	1	3	1	6	1	8	1
Recycling Technologies and Sustainable Development	2	8	2	3	2	2	1	/	1	1

Students opt for one of the 3 modules after completing the second year of study.

Figure 2 shows the number of graduate students classified by module in the mining engineering study program.

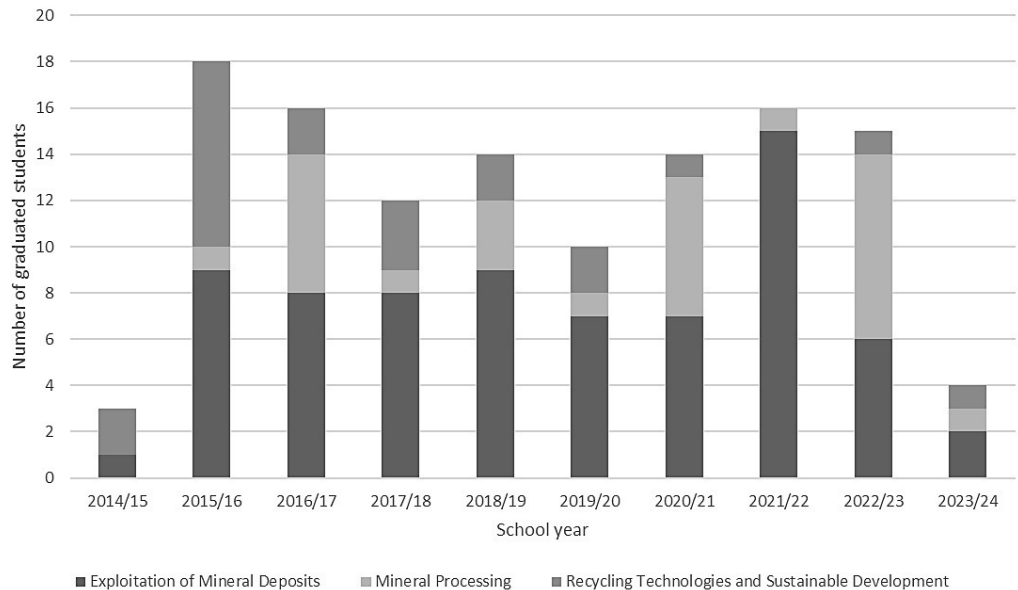


Figure 2, The number of graduate students classified by module in the mining engineering study program

The graphic shows that the highest number of students graduated from the Exploitation of Mineral Deposits module.

When enrolling in master's academic studies, students immediately choose one of the three offered modules in the mining engineering study program.

Table 3 shows the number of enrolled and graduated students in master academic studies.

Table 3, Number of enrolled and graduated students by school years
(Master Academic Studies)

Number of students	School year									
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Enrolled	9	7	13	16	15	18	16	15	16	13
Graduated	5	8	3	5	4	5	8	6	3	2

The maximum number of enrolled students is 16, of which 12 are on the budget of the Republic of Serbia and 4 are self-financed.

In the 2019/20 school year, a larger number of students were enrolled than the planned quota, due to the re-enrollment of students who had been in master's studies for 3 years.

Figure 3 shows a graph showing the number of enrolled and graduated students.

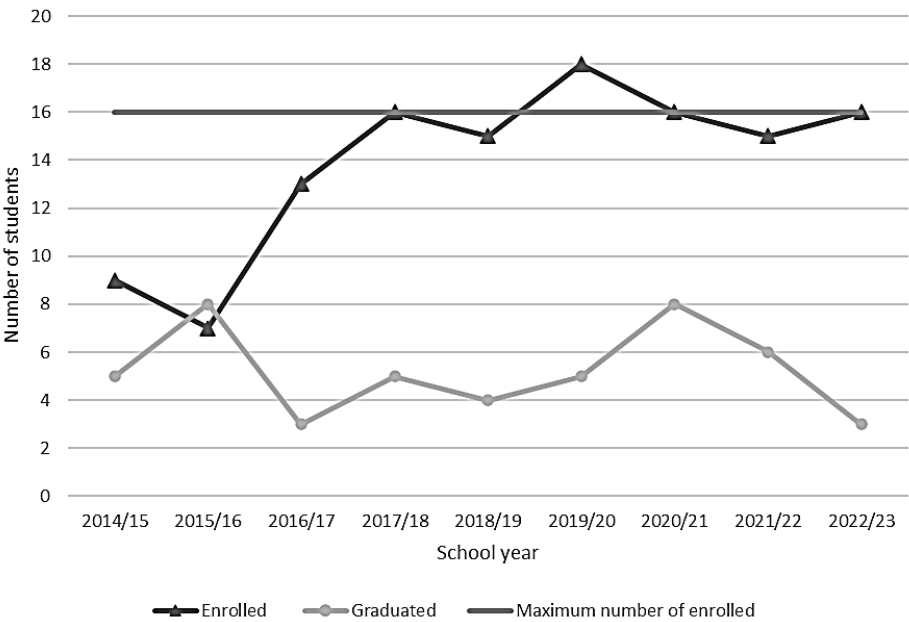


Figure 3, Graph of the number of enrolled and graduated students
(Master Academic Studies)

From the graph, we can see that students are interested in enrolling in master's academic studies, but not in completing them.

Table 4 shows the number of enrolled students and students who completed master's academic studies by modules in the mining engineering study program.

Table 4, The number of enrolled students and students who completed master's academic studies by modules

Mining Engineering - modules (Master Academic Studies)		School year									
		2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Exploitation of Mineral Deposits	Enrolled	4	1	7	9	11	12	11	7	12	7
	Graduated	4	3	/	3	2	3	/	4	3	/
Mineral Processing	Enrolled	3	4	3	5	/	5	4	8	4	6
	Graduated	1	3	3	1	2	/	4	1	/	2
Recycling Technologies and Sustainable Development	Enrolled	2	2	3	2	4	1	1	/	/	/
	Graduated	/	2	/	1	/	2	4	1	/	/

Figure 4 shows a graph showing the number of students enrolled in the master's academic studies in the mining engineering study program, classified by module.

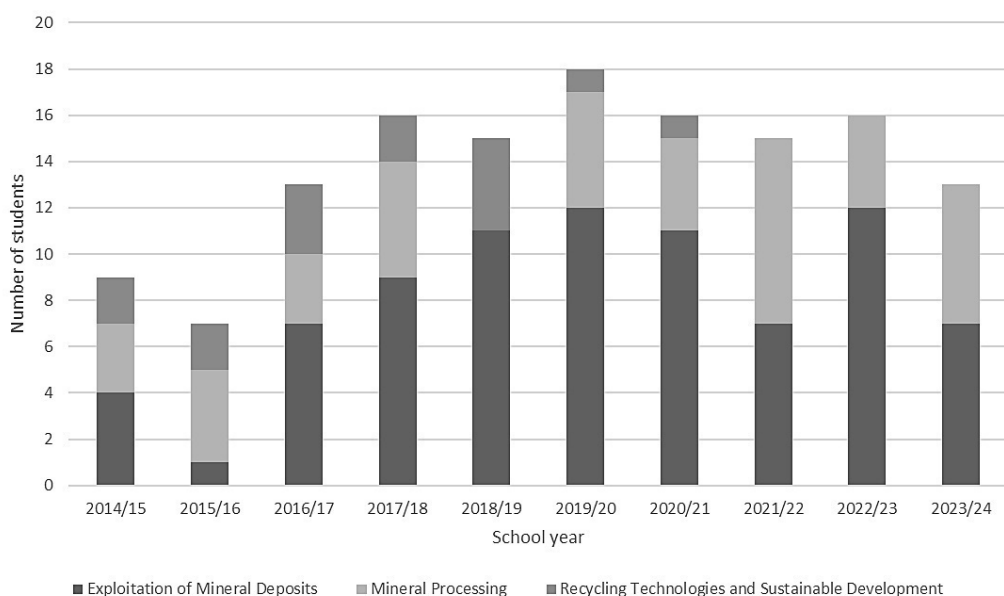


Figure 4, Graph of the number of students enrolled in master's academic studies classified by module

From the graph, we can see that the greatest interest of students in enrolling in the Exploitation of Mineral Deposits module

Figure 5 shows the graph of the number of students who completed the master's degree in the mining engineering study program, classified by module.

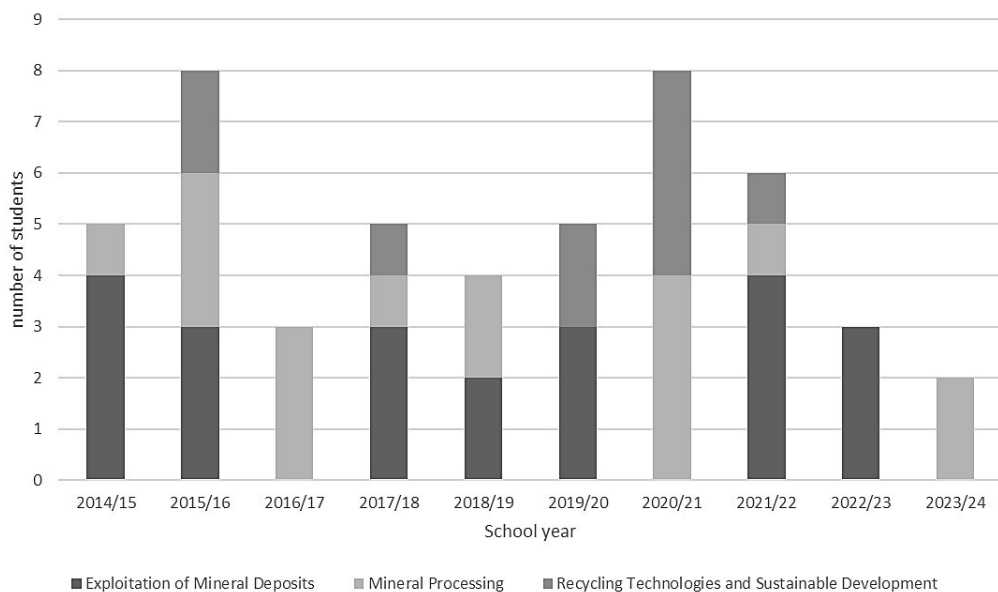


Figure 5, Graph of the number of students who completed the master's academic studies, classified by module

From the graph, we can see that the number of students who complete master's academic studies is very small.

CONCLUSION

Since there is a great shortage of well-trained personnel in the mining industry worldwide, the situation in Serbia is similar, and more should be done to publicize the study programs that the mining industry needs. It would also be important for mining companies to participate in the popularization of mining, because mining itself is necessary for the further development of humanity.

The number of students in the undergraduate academic programs in recent years is 20 to 30 students. The big problem is the lack of competition, which leaves room for the enrollment of high school graduates with poor knowledge of mathematics, physics, chemistry, etc.

ACKNOWLEDGEMENTS

The research presented in this paper was done with the financial support of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, within the funding of the scientific research work at the University of Belgrade, Technical Faculty in Bor, according to the contract with registration number 451-03-65/2024-03/200131.

LITERATURE

- [1] Technical faculty in Bor, English – Technical faculty in Bor, Retrieved August 20, 2024, from Technical faculty in Bor, 2021, <https://www.tfbor.bg.ac.rs/english#curriculum>.
- [2] Univerzitet u Beogradu - Tehnički fakultet u Boru, Šezdeset godina rada tehničkog fakulteta u Boru 1961-2021., Bor, Univerzitet u Beogradu - Tehnički fakultet u Boru, 2021.
- [3] Bor030, (2018, December 18), Istorijски dan, Zidin zvanično preuzeo RTB, borska kompanija dobija novo ime, Retrieved August 20, 2024 from Bor030, <https://www.bor030.net/istorijski-dan-zidin-zvanicno-preuzeo-rtb-borska-kompanija-dobija-novo-ime>.