

EMJM-PROMISE

ERASMUS MUNDUS JOINT MASTER IN SUSTAINABLE
MINERAL AND METAL PROCESSING ENGINEERING

NEWS 1/2023 MARCH

The EMJM PROMISE is being established due to the awareness of increasing demands in the quantity and diversity of minerals, metals, and materials as we move towards renewable energy, electromobility, digital communication and other clean-energy technologies.

PROMISE is the consortium involving the cooperation between four leading universities in mineral processing and mining engineering: **University of Oulu from Finland (UOULU)**, **Montanuniversität Leoben from Austria (MUL)**, **University of Zagreb from Croatia (UNIZG)**, and **Universidad Federico Santa Maria from Chile (USM)**.

1. THIRD (3B) SEMESTER IN ZAGREB 'PROMISE IS A FAMILY'

'We follow with dedication to our students so any of them get behind'.

Faculty of Mining, Geology and Petroleum Engineering EMJM-PROMISE is the third (of 31) faculty of the University of Zagreb (UNIZG) that participates in the implementation of EMJM studies (<https://www.rgn.unizg.hr/hr/oglasna-ploca/3194-erasmus-mundus-joint-master-in-sustainable-mineral-and-metal-processing-engineering-emjm-promise>). According to the mobility scheme (<https://www.master-promise.eu/mobility/>), a group of students (Figure 1) continued their studies in the third semester (3B) in Croatia at UNIZG.



Figure 1. *Welcome coffee and tea before the start of semester/classes (clockwise, from left, Muhammad Al, Seyedhamzeh Amiri Dehamadi, Dickson Adjei, Prof. Gordan Bedeković, Waqar Ahmad, Nelly Soledad Mollehuara Canales, Zixuan Zhang, Mahmood Nasr Abbas Shamsan, Subrina Islam, Niloofar Heydari, Nawaf Abdulrahman Murked Al-Murish and Maryrose Joy Aparece).*

The third (3B) semester started at the beginning of September, with prof. Želimir Veinović lecture (Figure 2) of the course Urban Mining. During the third (3B) semester, students were involved in various curricular and extracurricular activities.



Figure 2. First cohort of EMJM-PROMISE started semester with prof. Želimir Veinović.

Classes in the 3B semester ended in the end of December 2023, and the students started working on their master's thesis. Almost all of them *travelled to the fourth semester* where they are working on their master's thesis in cooperation with our industry partners (Appendix in the end of this news) and universities: the [University of Oulu](#) (Finland), [Montanuniversität Leoben](#) (Austria), Croatia ([University of Zagreb/Sveuciliste u Zagrebu](#)) and [Universidad Tecnica Federico Santa Maria](#)). We wish them all the best and a successful year 2024.

2. PROMISE RESULTS AND LEARNING OUTCOMES IN NUMBERS

Eleven (11) students attended the 3B semester of the EMJM-PROMISE study at UNIZG. Students must approve 30 ECTS (credits) each semester to pass to the next and all of students earned 31 ECTS credits.

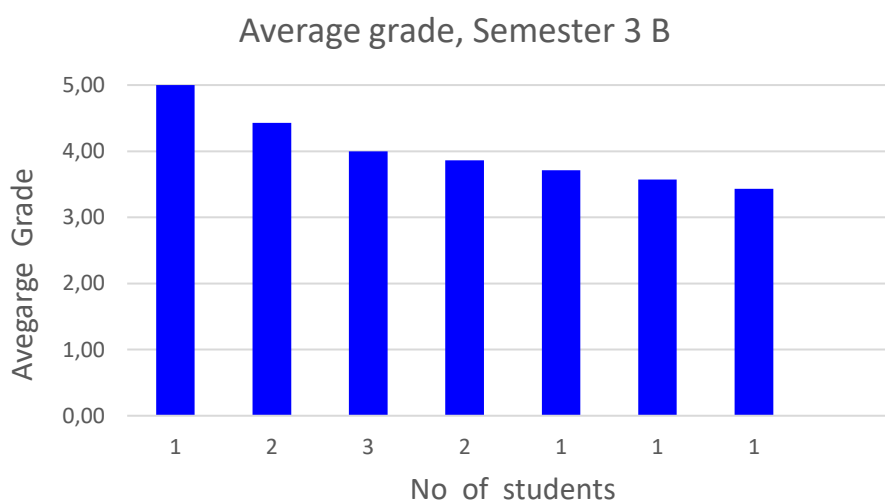


Figure 3. Average grade by student (compulsory & elective courses)

The individual average grade of students in the 3B semester ranged from 3.33 to 5.00, while the overall average grade of the entire group was 4.05. Congratulations to all students because all of them successfully passed all exams. The only one student with average maximum grade of 5.0 was Seyedhamzeh Amiri Dehamadi, so special congratulations to him.

The 3B semester consists of the following compulsory and elective courses:

Compulsory courses: *Recycling and Waste Treatment, Urban Mining and Circular Economy, Tailings Management and Reprocessing, Solid - Liquid Separation and Soil Remediation Technology.*

Elective courses: *Introduction to Croatian Language and Culture, Management of NORM Residues in Mining and Mineral processing, Environmental Geotechnics and Presentation and Publication of Research.*

3. LABORATORY EXERCISES ON WASTE RECYCLING

Our students had laboratory exercises in several courses. Laboratory exercises in course Recycling and Waste Treatment (Figure 4) were not performed individually, but in groups, which encouraged cooperation and teamwork.



Brainstorming of the groups in the lab.



Analysis of the Eddy current separator products



Comminution in cutting mill



Testing in Electrostatic separator



Discussion of the results of the laboratory exercises
Figure 4. Laboratory exercises in the Laboratory for Mineral Processing

4. RECYCLING AND MINE COMPANIES VISITS

Practice and theory are both important in the master program EMJM in Sustainable Mineral and Metal Processing Engineering. So, classes and laboratory exercises are complemented by teaching in the field i.e. by visits to companies that recycle specific types of waste and mining companies.



CIAK company (batteries recycling)



SPECTRA MEDIA company (WEEE recycling)



VETROPACK company (Glass recycling)



GUMIIMPEX company (car tyres recycling)



HOLCIM cement company (pit)



HOLCIM cement company (plant)



CIOS company (car recycling)



DEPOS company (recycling of waste fraction, after car recycling, RDF)



KNAUF company (introducing and safety lecture)



"ZOO" in DEPOS company (RDF in the background)

Figure 5. Teaching in the field

5. IN ADDITION TO FIELD TRIPS

After the “official part”, professional excursions are enriched with cultural content (such as visits KRANEAMUS, museum of Neanderthals in Krapina, Arena – Amphitheater in Pula, Memorial Centar Nikola Tesla in Tesla’s born place Smiljan).



Visiting museum KRANEAMUS in Krapina



Visiting Arena – Amphitheater in Pula



Visiting Memorial Center



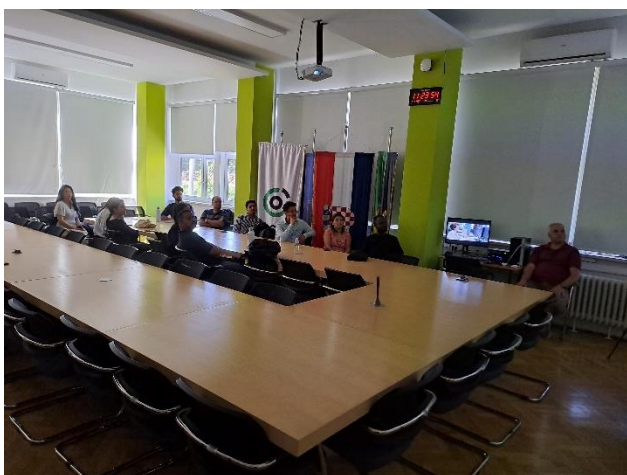
Nikola Tesla in Smiljan

Figure 6. Additional field trip activities

6. OTHER STUDENT'S ACTIVITIES DURING 3B SEMESTER IN CROATIA

We included PROMISE students into several sessions organized by our faculty/university:

- **Welcome Week** organized by University of Zagreb – students were involved in guided city tour, organ concert, several lectures (Religious Heritage of Croatia, Education system in Croatia, Croatian Culture and History, ...), Welcome speeches (Vice-Rector, Erasmus student Network, ...),
- **Welcome Day** organized by Faculty – students visited several faculty laboratories (Figure 7),
- **Zagreb EIT labelled induction day** organized by faculty and EIT Raw Materials with goal of improving awareness on the EIT, EIT Raw Materials, EIT Alumni, Raw Materials Academy, and labelled master programmes (Figure 9),
- **Students Gathering Day** organized by faculty – academic and cultural exchange (Figure 8).



Introducing lecture



Laboratory for blasting and testing of explosives



Laboratory for rock mechanics



Laboratory for X-ray diffraction (XRD)

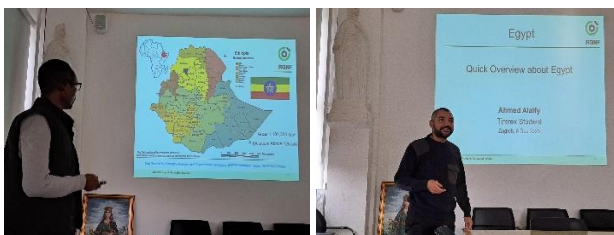


LAGEMA laboratory

Figure 7. Welcome Day at Faculty of Mining, Geology and Petroleum Engineering



PROMISE students who participated in Student Gathering



Individual student presentations



Figure 8. Students Gathering Day



Participation in the Zagreb EIT labelled induction day was also possible online
www.master-promise.eu



Group photo of the Zagreb EIT participants

Figure 9. Group photo of the Zagreb EIT labelled induction day

7. PUBLICATIONS

- 2023, Novi međunarodni studij: EMJM PROMISE – Sustainable Mineral and Metal Processing Engineering, Mineral&Gradnja, <https://www.mineral.com.hr/8890/novi-medjunarodni-studij-emjm-promise-sustainable-mineral-and-metal-processing-engineering>

(in Croatian).

www.master-promise.eu

8. FOLOW US AND BE INFORMED

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APPENDIX: ASSOCIATE PARTNERS OF EMJM-PROMISE

We are very thanks to our Associate Partners that with their Commitment Letter to support internships and thesis work, our program was successful in the application.



Spectra Media d.o.o., Croatia



Holcim (Hrvatska) d.o.o., Croatia



Metso:Outotec



Depos d.o.o., Croatia



MAELGWYN



Dragon Mining Oy



FLSmidth GmbH

Bernegger GmbH, Austria

CEMTEC Cement and Mining Technology GmbH, Austria

Zementwerk LEUBE GmbH, Austria

IFE Aufbereitungstechnik GmbH, Austria

RHI Magnesita GmbH, Austria

Omya GmbH, Austria

Binder & Co AG, Austria

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APPENDIX

The program was possible to the collaboration of many people. We are thanks to all of them as if was presented in the Kick-off meeting on 5th of September 2022.

Special thanks to Dr Marco Vera from USM and in a managerial role in SGS

PROMISE: ALL STARTED IN 2019!....

Creators of PROMISE

				
<i>Prof. Dr Claudio Acuna, USM</i>	<i>Prof. Dr Marco Vera, USM</i>	<i>Prof. Dr Gordan Bedekovic, UNZG</i>	<i>Prof. Dr Helmut Flachberger, MUL</i>	<i>Adj. Prof. Dr Maria Sinche Gonzalez, UQULU</i>