# RIS-RESTORE

## SUMMER SCHOOL 2021

30.8. - 3.9.2021
Online

**The appearance of circular economy concept and industrial symbiosis in the utilization of red mud**

Cutting edge lectures

Industrial symbiosis

REE recycling

Group work

Innovation pitching

Networking

eit Regional Innovation Scheme

eit RawMaterials Connecting matters

Funded by the European Union

# Basic information

RIS-RESTORE

## Organized by RIS-RESTORE project partners

TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

ZAG ZAVOD ZA GRADBENIŠTVO SLOVENIJE SLOVENIAN NATIONAL BUILDING AND CIVIL ENGINEERING INSTITUTE

MYTILINEOS

Alumina d.o.o. Zvornik

MINING INDUSTRY

GEOLOŠKI ZAVOD

BOSNA I HERCEGOVINA FEDERACIJA BOSNE I HERCEGOVINE FEDERALNI ZAVOD ZA GEOLOGIJU

UCG Univerzitet Crne Gore

PMF

UNIVERSITAS STUDIORUM TUZLAENSIS MCMLXXVI

UNIVERSITY OF NOVI SAD FACULTY OF TECHNOLOGY NOVI SAD

FACULTY OF SCIENCE BANJA LUKA

University of Ljubljana Faculty of Natural Sciences and Engineering

Gravity Mining

envirotis HOLDING

bay Bay Zoltán Nonprofit Ltd. for Applied Research

Metso:Outotec

NEMETALI

**When:** 5-day course; 30.8.-3.9. (Monday –Friday)

**Registration deadline:** 20th of August

**Register at:**

**http://ris-restore.zag.si/summer-school**

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## Why apply?

- Awarded with 1 ECTS!
- State of the art knowledge on red-mud
- Learning on the principles of Industrial symbiosis and circular economy
- Networking activities with other participants & group work
- Short innovation pitching course

## Which topics?

The Summer school will cover state of the art lectures in the topics of:

- Red-mud characterization (Day 1)
- Deposits in the ESEE region (Day 2)
- Extraction of REE from red mud (Day 3)
- Implementing industrial symbiosis - red mud recycling options (Day 4)
- Red mud utilization in the construction sector (Day 5)
- Short innovation pitching course & pitching session (Day 3 & 5)

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## Who should apply?

Summer school is focusing on the capacity building of the Master and PhD students from the ESEE region (Bosnia & Herzegovina, Serbia, Slovenia, Croatia, Montenegro, Greece, North Macedonia, Albania, Romania, Bulgaria). Other interested participants (researchers, professionals) will be selected on a case by case basis, depending on the open spaces after the **20th of August**.

The limit of participants is set to 25 and the following selection criteria will apply, if more will be registered:

- Master/PhD student from the ESEE region (Bosnia & Herzegovina, Hungary, Serbia, Slovenia, Croatia, Montenegro, Greece, North Macedonia, Albania, Romania, Bulgaria)
- Field of study (Chemistry, Metallurgy, Mining, Geology, Materials science, Environmental sciences)
- Motivational letter

The student applicants will be selected upon fulfillment of the above criteria on a first-come, first-serve basis. Other interested participants will be informed after 20th of August on the available open spaces. Selection criteria will be based on their field of profession, the same as fields of study listed above, and the date of application following first-come, first-serve principle.

**Registration deadline: 20th of August**

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# Schedule

# RIS-RESTORE

| Date | 30.8. | 31.8. | 1.9. | 2.9. | 3.9. |
|---|---|---|---|---|---|
| Time/Title | Day 1: Red-Mud "101" | Day 2: Red-Mud depositis in the ESEE region | Day 3: Extraction of REE from red mud | Day 4: Implemeting industrial symbiosis - red mud recycling options | Day 5: Implemeting industrial symbiosis - red mud recycling options in construction sector |
| 9:00 - 9:15 | Introduction | Introduction | Introduction | Introduction | Introduction |
| 9:15 - 9:30 | RIS -RESTORE project; **Dr. Ana Mladenovič, Dr. Mateja Košir** | Red mud in Podgorica - methods of red mud disposal, environmental problems in the surrounding area of red mud landfill / special review of the impact on groundwater, landfill management (specific examples from the field): **MSc Gordana Djukanović** | REE elements in bauxites and red mud In Montenegro: **Dr.Slobodan Radusinović** | Industrial symbiosis principles **:** **Dr. Alenka Mauko Pranjić** | Red mud utilization in the construction sector /remediation of contaminated soil with red mud: **Dr. Ana Mladenovič** |
| 9:30 - 9:45 | | | | | |
| 9:45 - 10:00 | | | | | |
| 10:00 - 10:15 | Produc tion of red mud- bauxite residue; **Alumina d.o.o** | Red mud tailing Dobro Selo /Mostar/: influence on the environment: **Dr sc. Alisa Babajić** | Magnetic separation techniques for red mud: **Dr. Matej Dolenec/Uroš Herlec** | Production of ceramic materials based on the byproducts: Laboratory and industrial level: **Dr. Snežana Vučetić, Helena Hirsenberger and Prof. Janja Ranogajec** | Red mud based geopolymers**:** **prof. Mira Vukčević** |
| 10:15 - 10:30 | | | | | |
| 10:30 - 10:45 | | | | | |
| 10:45 - 11:00 | Coffee break | Coffee break | Coffee break | Coffee break | Coffee break |

# Schedule

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| Date | 30.8. | 31.8, | 1.9. | 2.9. | 3.9. |
|---|---|---|---|---|---|
| **Time/Title** | **Day 1: Red-Mud "101"** | **Day 2: Red-Mud depositis in the ESEE region** | **Day 3: Extraction of REE from red mud** | **Day 4: Implemeting industrial symbiosis - red mud recycling options** | **Day 5: Implemeting industrial symbiosis - red mud recycling options in construction sector** |
| **11:00 - 11:15** | Mineralogy of bauxite and red mud; **prof. Nenad Tomašić** | Proposals for the remediation of the red mud landfill Dobro Selo near Mostar, Bosnia and Herzegovina: **MSc Vedad Demir** | "Apples to Aerospace": **Dr.Colin Collino** | From mud to bud: tailings and nanotechnologies: **Dr.Suzana Gotovac Atlagić** | Pitching session: Introduction |
| **11:15 - 11:30** | | Implementing SWOT Analysis for red mud valorization; Case studies of 4 Ris -Restore regions: **NTUA** | | | 5 pitches from student groups in max duration 5 minutes. |
| **11:30 - 11:45** | | Discussion | | | |
| **11:45 - 12:00** | Chemical analysis of red mud and other secondary raw materials: **Bence Kószó** | | Bauxite residue processing routes: **Dr.Panagiotis Davris** | Discussion | |
| **12:00 - 12:15** | | Lunch break | | Lunch break | |
| **12:15 - 12:30** | | | | | Closing ceremony |
| **12:30 - 12:45** | Discussion | | Lunch break | | |
| **12:45 - 13:00** | | | | | |
| **13:00 - 13:15** | Lunch break | Video lab tours | | Group work | Coffee break |