



eAMSS2020 – Virtual Arctic Mines Summer School in Mining and Mineral Processing, Finland

Theme: Circular Economy and Sustainable Mining

Credits (according ECTS system): 9

Schedule: 3 August – 28 August

Programme:

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Sustainable Mining Finland, 4 ECTS

Part 1: Overview of Mining Industry in Finland

Part 2: Geology in Finland

Part 2: Sustainability in Mining

Part 3: Circular Economy and Mines

Modern Mineral Processing 3 ECTS

Part 1: Basics in Mineral Processing

Part 2: Modern Beneficiation Technologies

Part 3: Case Studies: Mineral Processing in Selected Finnish Mines

Arctic Mines 2 ECTS

Part 1: Arctic Environment and Mines

Part 2: Gold Prospecting and Artisanal Mining

The course includes online expert lectures, online group works, individual learning as well as task-specific assignments and a final exam. The expert lectures will be recorded and can be accessed at any time convenient for you, but we strongly recommended real-time participation. Group work request real-time participation.

Timetable

	Date	Time (UTC+3)	Programme
1	Monday, August 3 rd	13:00 – 14:00	Welcome and opening ceremony <i>Dr. Matti Sarén, CEO and President of Kajaani University of Applied Sciences</i> <i>Dr. Risto Oikari, eAMSS2020 coordinator</i>
		14:00 – 15:00	Overview of Mining Industry in Finland <i>Dr. Harry Sandström, CEO, Mining Finland Association</i> <i>Mr. Matti Hietanen, CEO, Finnish Mineral Group</i>
2	Tuesday, August 4 th	8:15 - 9:45	Exploration and mining, global and local perspective Driving force of mineral industry, mineral value chain, Global trend of platinum group metals <i>Prof. Shenghong Yang, University of Oulu</i>
		10:00 - 11:30	Global trend of rare earth elements, copper, and gold <i>Prof. Shenghong Yang, University of Oulu</i>
		12:45 - 14:15	Global trend of battery metals (Co, Ni, Lithium), and iron

		14:30 - 16:00	<i>Prof. Shenghong Yang, University of Oulu</i> Exercise and group work
3	Wednesday, August 5 th	8:15 - 9:45 10:00 - 11:30 12:45 - 13:45 13:45 - 14:15 14:30 - 16:00	Ore Geology of Finland Geological evolution, Archean metallogeny, to early rifting related Cr, PGE, V <i>Prof. Shenghong Yang, University of Oulu</i> Late stage rifting related Ni-Cu-PGE, sedimentary stage polymetal, VMS belt, orogenic stage Ni, diamond <i>Prof. Shenghong Yang, U. Oulu</i> Orogenic gold deposits in Finland, iron oxide gold deposits Dr. Jukka-Pekka Ranta, University of Oulu Rare earth elements deposits in Fennoscandia Kimmo Kärenlampi, University of Oulu Exercise and group work
4	Thursday, August 6 th	8:00 – 9:30 10:00 – 10:30 10:45-11:30 13:00 – 14:45 15:00 – 16:00	Sustainability in Mining Introduction <i>Dr. Esther Takaluoma, Kajaani University of Applied Sciences</i> The challenges of energy transition and reaching a low-carbon economy <i>Mr. Eero Yrjö-Koskinen, Secretary General, Finnish Network for Sustainable Mining</i> Promoting sustainability and social license to operate in the Finnish mining sector <i>Mr. Eero Yrjö-Koskinen, Secretary General, Finnish Network for Sustainable Mining</i> Workshop and discussion on the sustainability Supervision of environmental impact of mines <i>Mr. Joni Kivipelto, Kainuu Centre for Economic Development, Transport and the Environment</i>
5	Friday, August 7 th	8:00 – 8:30 8:30 – 9:15 9:30 – 11:30 13:00 – 15:00	Sustainability in Mining Introduction <i>Dr. Esther Takaluoma, Kajaani University of Applied Sciences</i> Sustainability in Keliber's mine <i>Dr. Pekka Tanskanen, Keliber Ltd.</i> Sustainability in Hannukainen's mine <i>Dr. Jaana Koivumaa, Hannukainen Ltd.</i> Sustainability workshop
6	Monday, August 10 th	8:00 – 9:15 9:30 – 11:30 13:00 – 15:00 15:15 – 16:00	Circular Economy and Mines Introduction <i>Dr. Esther Takaluoma, Kajaani University of Applied Sciences</i> Utilization of mine tailings as cementitious binders <i>Professor Mirja Illikainen, University of Oulu</i> Student's presentations Facilitated session for homework, exercises, reading and discussion
7	Tuesday, August 11 th	8:00 – 8:30 8:30 – 9:30 9:45 – 10:30 10:45 – 11:30 13:00 – 16:00	Circular Economy and Mines Introduction <i>Dr. Esther Takaluoma, Kajaani University of Applied Sciences</i> Test beneficiation and their connection to circular economy in mining <i>Dr. Tommi Kauppila, Geological Survey of Finland</i> Introducing of KAMK's r&d-activities in mining sector <i>Dr. Esther Takaluoma, Kajaani University of Applied Sciences</i> Virtual laboratory tour <i>Dr. Esther Takaluoma and Dr. Tatiana Samarina, Kajaani University of Applied Sciences</i> Virtual laboratory exercises
8	Wednesday, August 12 th	8:00 – 8:30 8:30 – 9:30	Circular Economy and Mines Introduction <i>Dr. Esther Takaluoma, Kajaani University of Applied Sciences</i> topic to be announced <i>N.N., Tapojärvi Ltd.</i>

		9:45 – 12:30 14:00 – 16:00 16:00 – 17:00	Exercises to deepen understanding on circular economy Processing of secondary materials <i>Dr. Rodrigo Serno, Aalto University</i> Summarizing workshop on sustainability and circular economy in mining industry
9	Thursday, August 13 th	8:00 - 8:30 8:30 - 10:00 10:15 – 11:45 12:45-14:15 14:30 - 16:00	Basics in Mineral Processing Introduction to OMS <i>Professor Saija Luukkanen, University of Oulu</i> Introduction to Mineral Processing <i>Professor Saija Luukkanen, University of Oulu</i> Introduction to process mineralogy <i>Rita Kallio, University of Oulu</i> Analytical methods used in mineral processing <i>Antti Tanhua, University of Oulu</i> Sampling in Mineral Processing <i>Dr Maria Sinche Gonzalez, University of Oulu</i>
10	Friday, August 14 th	8:15 - 9:45 10:00 - 11:30 12:45 - 14:15 2:30-4:00pm	Mineral Processing Flotation <i>Professor Saija Luukkanen, University of Oulu</i> Physical Separation Processes <i>Dr Maria Sinche Gonzalez, University of Oulu</i> Leaching and metallurgical kinetics <i>Nelson Herrera, University of Oulu</i> Dewatering <i>Ville Keikkala, University of Oulu</i>
11	Monday, August 17 th	8:15 - 9:45 10:00 - 11:30 12:45 - 14:15 14:30 - 16:00	Modern Beneficiation Technologies Innovations in Mineral Separation <i>Dr Maria Sinche Gonzalez, University of Oulu</i> Quality of Concentrates for downstream processes <i>Professor Saija Luukkanen, University of Oulu</i> Past, present and future of technologies for tailing management <i>Raul Canales, University of Oulu</i> Sensor for Flotation <i>Claudio Leiva, University of Oulu</i>
12	Tuesday, August 18 th	8:15 - 9:45 10:00 - 11:30 12:45 - 14:15 14:30 - 16:00	Modern Beneficiation Technologies Health and Safety in Beneficiation Plants <i>Santeri Kaisanlahti, University of Oulu</i> Why to do Laboratory and Minipilot Plant Testing <i>Dr Maria Sinche Gonzalez, University of Oulu</i> Innovations in Comminution <i>Dr Marcos Bueno, University of Oulu</i> Mini-pilot plant testing (Video) <i>OMS RC</i>
13	Wednesday, August 19 th	8:00 – 10:00 10:00 – 12:00 13:00 – 15:00	Mineral Processing in Selected Finnish Mines Case Study 1, Agnico-Eagle Finland, Kittilä Mine <i>Topi Vaarala and Aki Auer</i> Case study 2, Mining economics and financing <i>Timo Lindborg, professor emeritus, CEO Sotkamo Silver Ab</i> Case Study 3, TBC <i>N.N.</i>
14	Thursday, August 20 th	8:00 – 10:00 10:00 – 12:00 13:00 – 15:00	Mineral Processing in Selected Finnish Mines Case study 4, Kemi Mine <i>Mr. Jyri Meriläinen</i> Case study 5, TBC <i>N.N.</i> Case Study 6, TBC <i>N.N.</i>

15	Friday, August 21st		Day for self-studies
16	Monday, August 24 th	8 am - 4 pm	Arctic Environment and Mines Arctic area as a living environment <i>Mr. Antti Peronius, Geology, CEO of Finnish Lapland Gold Miners Association</i> Geological resources in Arctic <i>Mr. Antti Peronius, Geology, CEO of Finnish Lapland Gold Miners Association</i>
17	Tuesday, August 25 th	8 am - 4 pm	Arctic Environment and Mines Mining in Finnish Lapland <i>Mr. Antti Peronius, Geology, CEO of Finnish Lapland Gold Miners Association</i>
18	Wednesday, August 26 th	8 am - 4 pm	Gold Prospecting and Artisanal Mines XXXX <i>Mr. Antti Peronius, Geology, CEO of Finnish Lapland Gold Miners Association</i>
19	Thursday, August 27 th	8 am - 4 pm	Gold Prospecting and Artisanal Mines XXXX <i>Mr. Antti Peronius, Geology, CEO of Finnish Lapland Gold Miners Association</i>
20	Friday, August 28 th	1 pm - 2.30 pm	Closing Ceremony <i>Professor Helka-Liisa Hentilä, vice rector of education, University of Oulu</i> <i>Professor Saja Luukkanen, University of Oulu</i> <i>Dr. Risto Oikari, eAMSS2020 coordinator</i>