



# EMS Education Committee Mathematics Summer School for school students 2023

Date and Location: 3-8 July 2023, Novotel Krakow City West Hotel, Krakow, Poland

Al. Armii Krajowej 11, 30-150 KRAKOW, POLAND

Host organization: Pedagogical University of Krakow, Poland

<https://emssummerschool.up.krakow.pl/>

## PROGRAMME and CONTENT

### 3 July 2023

Arrivals, (transfers from airport to those needed)

Registration

Welcome dinner at the hotel

### 4 July

09:30-10:45

- Welcome by the Chair of the EMS Education Committee (**MAKRIDES**)
- SUMMER SCHOOL PROGRAMME (**SZEMBERG**)
- Video play of the European Mathematical Society
- Useful guidebooks and tools from European Funded Projects(STEAME. STEAME-Hybrid, BYOD, FACILITATE-AI, STEAME-students, etc
- Introduction of student participants (**STUDENTS**)

10:45–11:00 Break

11:00-12:45 **Module 1 plus posting of problem challenge or project (KRAMER)**

13:00-14:30 Lunch

14:45-16:15 **Module 4 plus posting of problem challenge or project, (SZEMBERG)**

16:30 -18.15 **Module 6 plus project assignment (MAKRIDES)**

18.30 – 19.30 Rest time

20:00 Dinner

### 5 July

09:00-10:45 **Module 8 (GASINSKI)**

10:45-11:00 Break

11:00-12:45 **Module 2 (KRAMER)**

13:00-14:30 Lunch

14:45-16:15 **Module 5 (SZEMBERG)**

16:15 – 16:30 Break

16:30-18:00 **Module 10 (GRYSZKA)**



18:00-19:30 **Moderation: Discussion between students on the problem challenge or project (90 min)** KRAMER, SZEMBERG, MAKRIDES

20:00 Dinner

## 6 July

9.15 Departure

9:30-13:00 A visit to the Jagiellonian Museum, including artefacts from Copernicus, visit and walk around the old town campus: [https://maius.uj.edu.pl/en\\_GB/](https://maius.uj.edu.pl/en_GB/)

13:00-15:00 Lunch

15.00 – 16.00 rest time

16:00-17:45 **Module 3 (KRAMER)**

18:00-19:45 **Module 9 (GASINSKI)**

20:00 Dinner

## 7 July

09:00-10:45 **Module 7 (MAKRIDES )**

10:45-11:00 Break

11:00-13:00 **Module 11 (GRYSZKA )**

13:00-14:30 Lunch

14:30 – 18:00 Excursion: a visit to the historic museum of Cracow (under the Main Market); <https://muzeumkrakowa.pl/en/branches/rynek-underground>

19:30-20:00 **Closing ceremony, Follow up networking and farewell**

20:00 Farewell dinner at hotel

## 8 July

Organized Departures

### Topics covered by each professor

#### Jurg Kramer

Module 1: The abc conjecture for polynomials: Mason's theorem

Module 2: Fermat's last theorem: The case  $n = 4$

Module 3: Analogy between polynomials and integers: The abc conjecture for integers

#### Tomasz Szemberg

Modules 4, 5, "Poncelet-type Theorems" (projective geometry)

#### Gregory Makrides

Module 6: Sampling methods, statistical data analysis, SPSS, predictions

Module 7: Module 6 applications, real life applications, best practices



### **Leszek Gasiński**

Modules 8,9 i "Playing with graphs";

### **Karol Gryszka**

Modules 10, 11 provides 2 modules "On the Birkhoff ergodic theorem"

1. Happy numbers and their generalizations.
2. What does it mean to be normal in mathematics?

### **SOCIAL ACTIVITIES**

Social Activity 1: a visit to the Jagiellonian Museum, they have artefacts from Copernicus, to get there, visit and walk around the old town campus plus move back is around 3 hours;

[https://maius.uj.edu.pl/en\\_GB/](https://maius.uj.edu.pl/en_GB/)

Social Activity 2: a visit to the historic museum of Cracow (under the Main Market) is another 3 hours on a different day; <https://muzeumkrakowa.pl/en/branches/rynek-underground>

Possible Social Activity 3:- we could consider also going to Wieliczka Salt Mine, it takes half a day; by bus; <https://www.wieliczka-saltmine.com/>