NEW HORIZONS: EXPLORING THE POSSIBILITIES OF STUDY ABROAD IN THE CONTEXT OF A “NEW NORMAL”
Program Overview

- Foundations of CS, Applications, Design, Entrepreneurship, Humanities, Hungarian language
- Approximately 70 students/semester
- World-class faculty (Erno Rubik, Peter Szeredi, …)
- Classes sizes: 10-15 students
- Program under academic auspices of BME, world’s oldest institute of technology
Academic Program (sample)

- Foundations
  - Algorithms, theory of computation, combinatorial optimization, logic programming, quantum probability and logic
- Applications
  - Deep learning, cryptography, computational biology
- Creative design
  - Design workshop, leadership and entrepreneurship
- Humanities
  - Budapest studies, Hungarian music, Hungarian cinema
Most students from liberal arts colleges
- Grinnell, Bryn Mawr, Dartmouth, Carleton, Smith, Pomona, Harvey Mudd, Davidson, Middlebury, Williams, Wesleyan, Mt. Holyoke, Whitman

Some large universities

Background
- Proof-based math course
- Programming course
Student Life

- Students live in apartments in the heart of the city
- Dedicated AIT staff
- Organized excursions
Web search: AIT Budapest
Mathematics Education in Hungary

Paul Erdős  Vera Sós  George Pólya

(How do they do it? Glad you asked!)
Hungarian Mathematics Pedagogy

1. Problem solving and excitement of discovery.
2. Freedom to argue and to make (and learn from) mistakes.
3. Viewing math as a whole discipline, stressing connections.
4. Teacher’s role: motivator and facilitator.
Budapest Semesters in Mathematics Education

- Semester-long (or summer) program in Budapest, for undergrads and recent grads interested in teaching secondary mathematics.

- **Goal:** To experience and study the *Hungarian pedagogy*. 
BSME Approach

- Learn mathematics through the Hungarian pedagogy.
- Observe Hungarian mathematics classrooms.
- Teach their own lessons to Hungarian students.
BSME Courses

- Practicum: Experiencing the Hungarian Approach through Observation and Teaching
- Discovery Learning: The Pósa Method
- Teaching Geometry through Problem Solving
- Gamification and Playfulness in Teaching Mathematics
- Directed Research: Discovery Learning in Secondary Schools
Budapest!
BSME welcomes students who are:

- Pursuing mathematics teaching license.
- Planning to pursue other paths to licensure.
- Simply curious about learning and teaching.
Contact Information

- Email: bsme@bsmeducation.com
- For more information and online application: bsmeducation.com
CIMAT: CENTRO DE INVESTIGACIÓN EN MATEMÁTICAS

- Research Center founded in 1980
- Pure & applied Mathematics, Probability & Statistics, Computer Sciences
- Undergraduate, Masters & Doctoral programs
- Rich academic atmosphere on campus
MATHEMATICAL SCIENCES SEMESTERS IN GUANAJUATO

MSSG is an international study abroad program open to undergraduate students with a strong grounding in Mathematics who want to increase their knowledge of data science, modeling, mathematical finance and partial differential equations from a comprehensive, forward-looking, and cutting-edge perspective while acquiring a solid theoretical foundation.
 Mathematical Sciences Semesters in Guanajuato

Up-to-date, applications-oriented curriculum taught in English
Credits transferable with CIMAT transcript
Small study groups of highly-motivated students
Individual attention to every student (TA & Academic Tutor)
Peer Ambassadors to support social & cultural integration
Cultural Immersion: Spanish language and Mexican culture courses
Academic Immersion: Rich academic environment with opportunities to encounter mathematics applied across many areas of research.

TOTAL IMMERSION: MATHEMATICS & MEXICAN CULTURE
STUDENT SUPPORT & PREPARATION

- Pre-Departure support
- On-site Orientation (Health & Safety)
- 24/7 health professionals on call
- Mental Health Support available
- 24/7 support for emergencies
- Support in housing placement
- Peer Mentors & Student Community

STUDENT LIFE IN GUANAJUATO

- A great city to learn Spanish
- Walkable
- Friendly & warm
- Amazing climate!
- Traditions & Heritage
- Cosmopolitan & Diverse - Vibrant Art & Cultural scene
- University town: Opportunities for trying new things
- Close to San Miguel de Allende
MATHEMATICAL SCIENCES SEMESTERS IN GUANAJUATO

SEMESTER-BASED PROGRAMMING: 14 WEEKS

FALL: Mathematical Tools for Modeling
SPRING: Mathematical Tools for Data Science

SUMMER SHORT-COURSES: 3 WEEKS

Mathematical Finance
Differential Equations, Modeling & Computing Simulation
A Journey through Data Science
MSSG SUMMER 2022: SHORT-COURSE SERIES

Short-term, intensive study abroad programs designed for STEM majors

- Join a small, diverse cohort of students in a dynamic and collaborative learning atmosphere.
- Engage with real-world applications of mathematical concepts
- Broaden your horizons through mini language, culture and arts workshops throughout your visit in the beautiful colonial city of Guanajuato Capital.

DEADLINE TO APPLY: March 18, 2022

SESSION OPTIONS:

- Differential Equations, Modeling & Computing Simulation
- Mathematical Finance
- A Journey Through Data Science

LEARN MORE:

LEARN MORE:

PROGRAM DATES

Session One: May 29th to June 19th
Session Two: June 26th to July 17th

DEADLINE TO APPLY

March 18, 2022

CONTACT US FOR MORE INFO: mathsciencesgto@cimat.mx

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WHO ARE OUR STUDENTS?

UNDERGRADUATE STUDENTS WHOSE MAJORS/MINORS INVOLVE MATHEMATICS, STATISTICS, DATA SCIENCE OR COMPUTER SCIENCE. THOSE WHO ARE LOOKING TO LEARN ABOUT

HAVE SUCCESSFULLY COMPLETED:

- Linear Algebra
- Differential, Integral and Multivariate Calculus
- Programming experience
- Experience with proof writing (fall)

CONTACT US:
mathsciencesgto@cimat.mx

TO APPLY:
https://mathsciencesgto.cimatr.mx
The Program

• A program for undergraduate math majors to study mathematics in Budapest, Hungary.
• One semester (Fall or Spring) or a full year or Summer
• Classes in English
• Designed for juniors and seniors
• Classes are small (10-20)
• Average 65-75 students per semester
The Program, continued…

• Students come from roughly 40 different institutions each semester
• Instructors are members of Eötvös University or the Mathematical Institute of the Hungarian Academy of Sciences
• Most instructors have experience teaching North American students
Living in Budapest

• Students may live in furnished apartments (with other BSM students) throughout the city.
• Budapest is an easy city to navigate with excellent public transportation.
• The school where classes are held is centrally located in historic Budapest.
Academics

• 15 week semesters
• Courses meet 2 to 3 times per week and may be taken Graded or Audit
• Classes stress problem solving and fostering student creativity and group learning
• Hungarian language and culture classes satisfy many home school requirements
• Optional intensive Hungarian language course prior to the semester
Sample Courses

- Abstract Algebra
- Combinatorics
- Complex Functions
- Conjecture and Proof
- Differential Geometry
- Graph Theory
- Galois Theory
- Probability Theory
- Mathematical Problem Solving
- Number Theory
- Set Theory
- Introduction to Topology
- Real Functions and Measures
- Topics in Analysis
Applicant profile

• Must have at least second year status
• Must have completed a first theory course in analysis or abstract algebra
• Should be highly motivated to study mathematics
• Independent and passionate about academics
• Average home school GPA is 3.7
Opportunities for students

• Students can take the Putnam Exam in December.
• Students can take the GRE while in Budapest.
• Opportunities to participate in research with Hungarian Scholars.
• Chance to meet Hungarian students through social activities.
• Travel (in and around Hungary)
Application process

• Fall semester deadline: April 1
• Spring semester deadline: October 15
• Summer Program: March 1

• Fill out an online application
• Provide an official transcript
• Provide two letters of recommendation

• Find application materials and contact information at www.budapestsemesters.com
„Math in Moscow“ Semester program
https://mathinmoscow.org/


Over 400 students from 200 universities have participated in the program;

Over 100 of them have already got their PhD degrees.

Spring 2022 and Fall 2022 semesters – online instruction.
Classes

The courses are taught in English;

The groups are very small (2-8 students);

Proof-based courses;

A lot of students have valued the program as an excellent preparation for a graduate school.
# Courses

## Elementary courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Advanced Linear Algebra</td>
<td>Non-Euclidean geometry</td>
</tr>
<tr>
<td>Basic Algebra</td>
<td>Ordinary Differential Equations</td>
</tr>
<tr>
<td>Combinatorics</td>
<td>Programming: from an Art to a Science</td>
</tr>
<tr>
<td>Geometric Foundations of Analysis</td>
<td>Topology I</td>
</tr>
</tbody>
</table>

## Intermediate courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Advanced Algebra</td>
<td>Computability and Complexity</td>
</tr>
<tr>
<td>Algebraic Geometry: start-up course</td>
<td>Differential Geometry</td>
</tr>
<tr>
<td>Algebraic Number Theory</td>
<td>Dynamical Systems</td>
</tr>
<tr>
<td>Basic: Representation Theory</td>
<td>Knot Theory</td>
</tr>
<tr>
<td>Calculus on Manifolds</td>
<td>Topology II: Introduction to Homology and Cohomology Theory</td>
</tr>
<tr>
<td>Complex Analysis</td>
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</tr>
</tbody>
</table>

## Advanced courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Course</th>
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<tbody>
<tr>
<td>Equations of Mathematical Physics</td>
<td>Mathematical Catastrophe Theory</td>
</tr>
<tr>
<td>Introduction to Commutative and Homological Algebras</td>
<td>Riemann Surfaces</td>
</tr>
</tbody>
</table>

## Non-mathematical courses

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Russian Language I</td>
<td>Russian Literature</td>
</tr>
<tr>
<td>Russian Language II</td>
<td></td>
</tr>
</tbody>
</table>
Ask our alumni

We are very grateful to our student alumni who have agreed to answer to our prospective students' individual questions about their MIM experience. Below you will find their contact data. Please ask an email questions and request an interview.

<table>
<thead>
<tr>
<th>Name</th>
<th>Email address</th>
<th>Home university</th>
<th>MM semester(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilton Ballard</td>
<td><a href="mailto:willbaldard@gmail.com">willbaldard@gmail.com</a></td>
<td>Portland College</td>
<td>Fall 2006/2007, Spring 2007/2008</td>
</tr>
<tr>
<td>Yuzhuo Chen</td>
<td><a href="mailto:yzhang17@gmail.com">yzhang17@gmail.com</a></td>
<td>Beijing Normal University, Hong Kong Baptist University</td>
<td>spring 2020</td>
</tr>
<tr>
<td>Reuben Perks</td>
<td><a href="mailto:reubennperks@gmail.com">reubennperks@gmail.com</a></td>
<td>Lund University (Sweden)</td>
<td>Fall 2015, Spring 2016</td>
</tr>
<tr>
<td>Cevat Altay</td>
<td><a href="mailto:cebaltay@columbia.edu">cebaltay@columbia.edu</a></td>
<td>Washington University in St. Louis</td>
<td>Fall 2016</td>
</tr>
</tbody>
</table>
Deadline for the Fall 2022 applications - May 15
Contact us: mim@mccme.ru
https://mathinmoscow.org/
https://www.facebook.com/MathMoscow