



CIMAT
International
Program



CIMAT

Study Abroad

in Guanajuato Mexico

**MATH,
FRIENDS &
CULTURE**

**MATHEMATICAL
SCIENCES SEMESTERS
IN GUANAJUATO MÉXICO**



THE FORUM
ON EDUCATION ABROAD

MEMBER

GUANAJUATO, GUANAJUATO, MEXICO

- In Guanajuato the past and the present meet each other.
 - With the traditions and folklore of the *Guanajuatenses* and the joyful spirit of visitors, residents & students from all over the world.
- UNESCO World Heritage City:
 - Guanajuato became the world's leading silver-extraction centre in the 18th century. This past can be seen in its 'subterranean streets'.



CENTRO DE INVESTIGACIÓN EN MATEMÁTICAS

- Federally-funded Research Center founded in 1980
- Pure & Applied Mathematics, Probability & Statistics, Computer Science
- Undergraduate, Masters & Doctoral programs
- Rich academic atmosphere on campus
- Guanajuato - Aguascalientes - Mérida - Monterrey – Zacatecas



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ABOUT CIMAT

In numbers:

- 118 researchers
- 84 in Gto.
- 199 postgrad.
- 114 in Gto.
- Students:
- 40% in PhD
- 18% in Masters

Colombia
Cuba
Guatemala
Bolivia
Honduras
Brasil
Bulgaria
USA
Japan

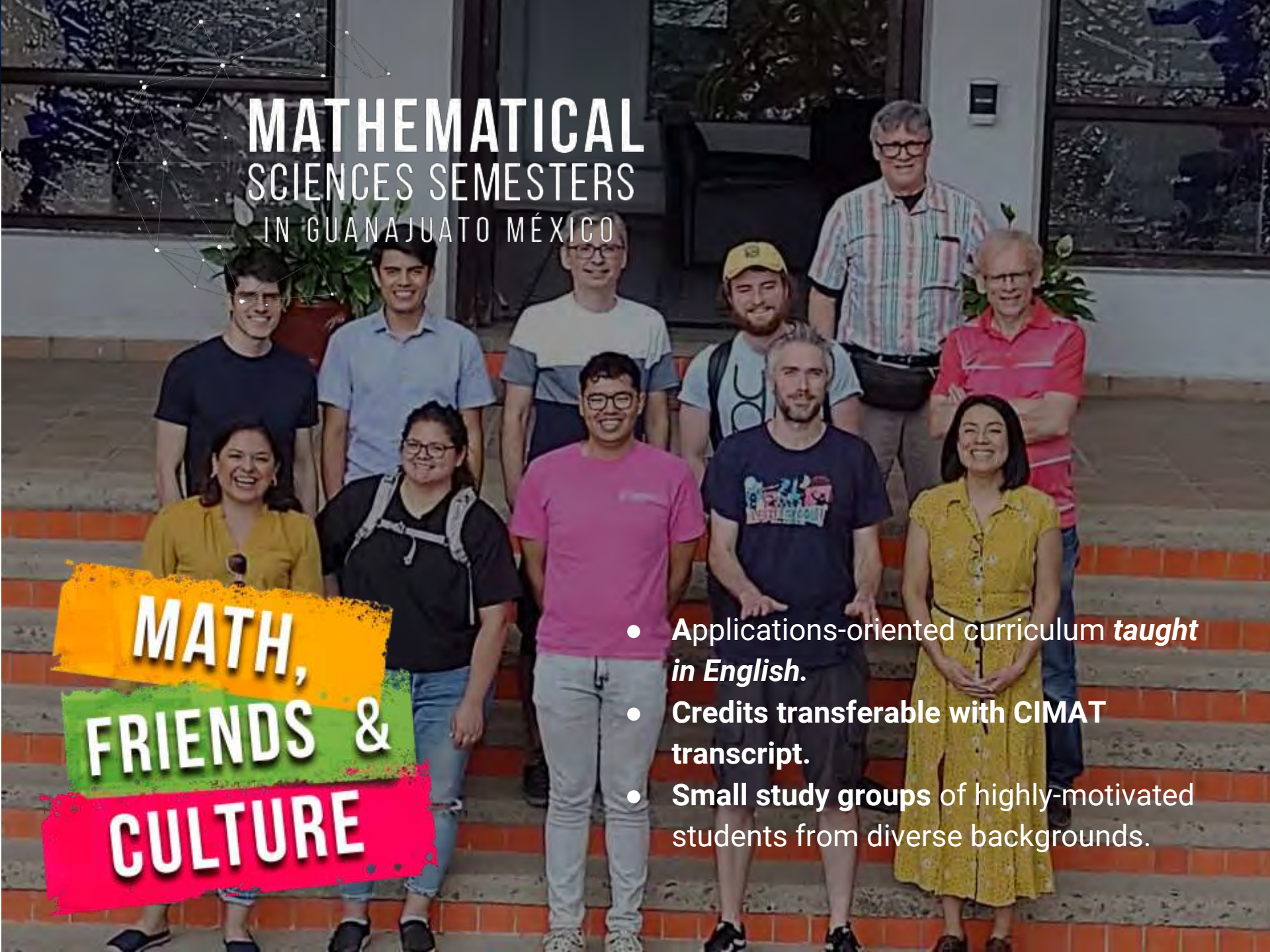
Research

Teaching

Knowledge and Technology Transfer
Outreach



Undergraduate programs -
Collab. University of Gto.



MATHEMATICAL SCIENCES SEMESTERS IN GUANAJUATO MÉXICO

**MATH,
FRIENDS &
CULTURE**

- Applications-oriented curriculum *taught in English*.
- Credits transferable with CIMAT transcript.
- **Small study groups** of highly-motivated students from diverse backgrounds.

INTENSIVE SHORT-COURSES

3 WEEKS

SUMMER:

Data-driven Dynamic Modeling

A Journey Through Data Science



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J-TERM:

Stochastic simulation using probability models



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**MATHEMATICAL
SCIENCES SEMESTERS**
IN GUANAJUATO MEXICO

SUMMER

COURSE: DATA-DRIVEN DYNAMIC MODELING



The course is on **modeling physical phenomena** with ordinary differential equations (**ODE**).

The mathematics of each model is presented. The **computational tools** for simulation are developed, and models are tested with real data.

OVERALL REQUIREMENTS:

- MATRIX ALGEBRA COURSE
- SINGLE AND MULTIVARIATE VARIABLE CALCULUS COURSE

SUMMER

COURSE: A JOURNEY THROUGH DATA SCIENCE



An introduction to Data Science, covering:
data visualization,
prediction and regression modeling,
introduction to neural networks.

Focus on data analysis, group work and discussion

OVERALL REQUIREMENTS:

- YOUR INTENDED MAJOR IS RELATED TO MATHEMATICS, STATISTICS, DATA SCIENCE, OR CS
- EXPERIENCE WITH PROGRAMMING (R OR PYTHON) IS DESIRABLE

J-TERM

COURSE: STOCHASTIC SIMULATION USING PROBABILITY MODELS



The course focuses on simulation in settings that may involve **random inputs and outputs**.

Mathematically, the course includes a sound introduction to discrete probability models focusing on **Bernoulli trials** and associated distributions.

Basic random processes such as the **Poisson process**, the **random walk**, and **Markov chains** are discussed.

OVERALL REQUIREMENTS:

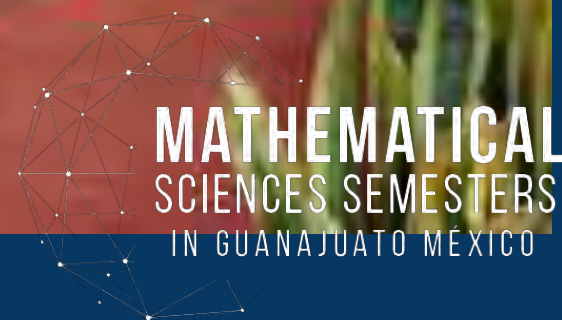
- ELEMENTARY PROBABILITY OR STATISTICS COURSE.
- BASIC EXPERIENCE IN CODING
- SOME KNOWLEDGE OF R OR PYTHON IS DESIRABLE

STUDENT LIFE & EXPERIENCE

https://www.youtube.com/watch?v=NQfebdkS4rY&ab_channel=MathSciencesinGuanajuatoMexicobyCIMAT



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SEMESTER-BASED PROGRAMS

14 WEEKS



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SPRING:

Mathematical Tools for Data Science

FALL:

Mathematical Tools for Modeling

**MATHEMATICAL
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FALL SEMESTER

MATHEMATICAL TOOLS FOR MODELING



During this semester, we focus on six areas of Mathematics which have had a huge impact on applications: Algebra, Linear Algebra, Differential Equations, Differential Geometry, Complex Variables, and Probability.

COURSES:

- DISCRETE PROBABILITY AND SIMULATION
- TOOLS FOR MODELING DYNAMICS
- ALGEBRA AND ITS APPLICATIONS
- MODELING WITH DIFFERENTIAL GEOMETRY
- MODELING WITH LINEAR ALGEBRA
- FUNCTIONS OF A COMPLEX VARIABLE
- + LEVELING COURSE IN CODING
- +INDEPENDENT RESEARCH PROJECT

SPRING SEMESTER

MATHEMATICAL TOOLS FOR DATA SCIENCE



Data science is about learning from **data**.

Positioned at the intersection of Applied Mathematics, Computer Science and Statistics, it demands an integrated approach. The goal is to provide students with a solid and rigorous **problem solving-oriented** understanding of concepts and terminology, equipping them with the ability to choose relevant and efficient algorithmic solutions for solving problems in Data Science and mathematical modeling.

COURSES:

- DESIGN OF ALGORITHMS
- PROBABILITY AND STATISTICS
- NUMERICAL OPTIMIZATION & MACHINE LEARNING
- GEOMETRIC & GRAPHING TOOLS
- + LEVELING COURSE IN PYTHON
- + INDEPENDENT RESEARCH PROJECT

SPECIAL SEMINARS & WORKSHOPS:

- DATA SCIENCE KITCHEN

STUDENT LIFE & EXPERIENCE

https://www.youtube.com/watch?v=UHxM2gwfdFs&ab_channel=CIMAT



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CULTURAL & LANGUAGE OPPORTUNITIES



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Intensive Short Courses

- Mexico: Language and Cultural Journey

Semester based program

- Spanish Language classes

- City & museums Tours
- Hikes & outdoor activities
- Mexican cooking classes, art & dancing
- Astronomical visit & math rally



SOCIAL & CULTURAL LEARNING OPPORTUNITIES



STUDENT SUPPORT & PREPARATION

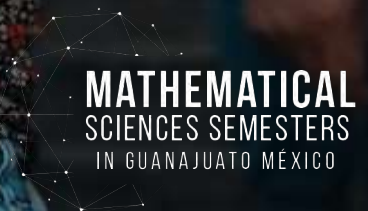
- Pre-Departure support
- On-site Orientation (Health & Safety)
- Mental Health Support available
- 24/7 support for emergencies (third party service)
- Support in housing placement for Semester Based Program (For short courses the accommodation is in a hotel)
- Peer Mentors & Student Community



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**MATHEMATICAL
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HEALTHCARE AGENCY

THIRD PARTY SERVICE

- Concierge healthcare and patient engagement services to residents and visitors
- For students visiting Guanajuato, they offer a workshop on preventative care and wellness while abroad in Mexico
- A basic check-up with our in house GP and 24/7 support in the event of illness or a medical emergency

Note: This is not medical or travel insurance.

Comprehensive international medical insurance that is valid in Mexico for at least the duration of your stay must be acquired prior to your arrival date.



GENERAL REQUIREMENTS & APPLICATION

INTENDED MAJOR SHOULD INCLUDE COMPONENTS INVOLVING MATHEMATICS, STATISTICS, DATA SCIENCE OR COMPUTER SCIENCE.

TO APPLY:

- Apply online on our website at <https://mathsciencesgto.cimat.mx>
- Submit current transcript & a valid passport
- 2 letters of recommendation

EXPECTATIONS:

- Complete full application and registration process
- Complete virtual orientation
- Enroll & complete a course load of a minimum of three mathematics sciences courses (semesters)

IMPORTANT INFO

INTENSIVE SHORT COURSES:

Program duration: **3 weeks**

- Application/Admission & Confirmation fee: USD \$100¹
- Tuition fee: USD \$3000
 - Plus \$2000 mexican pesos (USD \$125 approx.) paid directly to the healthcare agency, required

- Lodging
- Lunch on campus (Monday - Friday)
- Ground transportation to and from the airport (BJX) in day flights
- Safe & Smart: Orientation and guided tour of the city & local transportation
- One-to-one 24/7 support from healthcare agency in the city

SEMESTER BASED PROGRAMS:

Program duration: **15 weeks**

- Application/Admission & Confirmation fee: USD \$100¹
- Tuition fee: USD \$7400
 - Plus \$5000 mexican pesos (USD \$300 approx.) paid directly to the healthcare agency, required

- Ground transportation to and from the airport (BJX) in day flights
- Safe & Smart: Orientation and guided tour of the city & local transportation
- Individualized support system (peer & academic mentors)
- One-to-one 24/7 support from healthcare agency in the city

¹ Not applicable for early bird applications

HOUSING AND LODGING



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Semester Student Housing

- Independent Student housing
- Proximity
- Great neighborhood
- Student & Faculty community
- Safe & Comfortable amenities
- Independent room assignments

Intensive Short-Courses

- Centrally located hotel Accommodations
- Individual rooms: bed, WIFI and workspace, TV, private bathroom
- Beautiful rooftop for visiting, studying and relaxing
- On-site restaurant with extensive menu



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BROADEN YOUR HORIZONS & WELCOME ABOARD!



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¡Gracias! – Thank you for your visit!

mathsciencesgto@cimat.mx

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Centro de
Investigación en
Matemáticas, A.C.