



# Bilbo Summer Maths 2016

20.Jun - 01.Jul 2016

Cód. 361-16

**Mod.:**  
Presencial

**Edición**  
2016

**Tipo de actividad**  
Curso de Verano

**Fecha**  
20.Jun - 01.Jul 2016

**Ubicación**  
Escuela Técnica Superior de Ingeniería de Bilbao

**Idiomas**  
Inglés

**Web**  
<http://matematika-txokoa.eus/en/summercourses/>

## DIRECCIÓN

**Ainhoa Iniguez Goizueta**

**Comité Organizador**



Fundación  
BBVA



## Descripción

Registration: <http://matematika-txokoa.eus/en/summercourses/>

This course organised by *Matematika-txokoa* is for students aged 15-18 with the aim to promote science via the mathematics in them.

It is aimed at students interested in science in general; not only in mathematics but also in physics, biology, chemistry, engineering... You will all be able to enjoy discovering new concepts. If you weren't aware that mathematics is hiding in every science, this is a great opportunity to discover these connections and to learn about plenty of interesting applications: encryption, molecular biology, electrical engineering, nanotechnology...

It will last 10 days, 4 hours per day in a seminar/workshop format as well as exploring with some experiments.

## Objetivos

This course organised by *Matematika-txokoa* is for students aged 15-18 with the aim to promote science via the mathematics in them.

It is aimed at students interested in science in general; not only in mathematics but also in physics, biology, chemistry, engineering... You will all be able to enjoy discovering new concepts. If you weren't aware that mathematics is hiding in every science, this is a great opportunity to discover these connections and to learn about plenty of interesting applications: encryption, molecular biology, electrical engineering, nanotechnology...

We want the students to “play” with science, and for that, we will guide them to immerse into a creation process through some workshops.

The course will be given by a group of mathematicians and physicists of the University of Oxford and UPV/EHU. It will last 10 days, 4 hours per day in a seminar/workshop format: 9-11am and 11.45am-1.45pm. Furthermore, we will give each participant the opportunity to be supervised to do a little project.

Additionally, we have invited some internationally recognised scientific researchers who will come to talk to you about their work and their experience.

## Colaboradores específicos del curso



ENERGIÁ-OLATUAK / OLAS DE ENERGÍA  
DONOSTIA / SAN SEBASTIÁN 2016  
DSS2016.EU



# Programa

## 20-06-2016

09:00 - 13:45 Mathematical writing and reasoning.

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## 21-06-2016

09:00 - 13:45 Complex numbers in electrical engineering, electromagnetism and fluid dynamics.

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## 22-06-2016

09:00 - 13:45 Group theory: concept of a group, properties and examples. Permutations and computations. Dihedral and symmetric groups.

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## 23-06-2016

09:00 - 13:45 Group theory: permutations in Rubik's cube and molecular symmetries to foresee properties of molecules.

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## 24-06-2016

09:00 - 13:45 Number theory: modular arithmetic, cyclic groups and diophantine equations.

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## 27-06-2016

09:00 - 13:45 Number theory: Fermat's little theorem, Euler's theorem and Euler's last theorem-Andrew Wiles. RSA encryption method. Is purchasing online safe?

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## 28-06-2016

09:00 - 13:45 Topology: metric spaces, examples with different metrics, topological spaces and properties.

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**29-06-2016**

09:00 - 13:45

Topology: homeomorphisms-can you differentiate between a doughnut and a coffee cup? Topology is useful to understand the DNA structure!

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**30-06-2016**

09:00 - 13:45

Mathematical universe-from the atoms to the galaxies: physics basics ( forces, work, energy....) We're made of atoms! The Atomic Molecular Theory.

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**01-07-2016**

09:00 - 13:45

Mathematical universe-from the atoms to the galaxies: searching for quantum computers, what is a quantum? Into the nano-universe: physics basics at nano-scale. The universe in a nutshell: relativity nowadays, Einstein and GPS.

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**Dirigido por:**



**Ainhoa Iniguez Goizueta**

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# **Lugar**

## **Escuela Técnica Superior de Ingeniería de Bilbao**

Alameda Urquijo s/nº. 48013-Bilbao

Bizkaia