



# Bilbo Summer Maths 2016

Eka. 20 - Uzt. 01 2016

Kod. 361-16

**Mod.:**

Aurrez aurrekoa

**Edizioa**

2016

**Jarduera mota**

Uda Ikastaroa

**Data**

Eka. 20 - Uzt. 01 2016

**Kokalekua**

Bilboko Ingeniaritza Goi Eskola Teknikoa

**Hizkuntzak**

Ingelesa

**Antolakuntza Batzordea**

/ NUMBER THEORY /  
/ GEOMETRY AND TOPOLOGY /  
/ GROUP THEORY /  
/ PHYSICS OF THE FUTURE /  
WHAT ARE WE TALKING ABOUT?

**Bilbo**  
**Summer Maths**

20th JUNE /  
1st JULY

FOR STUDENTS AGED 15 -18  
FACULTY OF ENGINEERING  
UPV/EHU, BILBAO

[info@matematika-txokoa.eus](mailto:info@matematika-txokoa.eus)  
[www.matematika-txokoa.eus](http://www.matematika-txokoa.eus)



# Azalpena

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.

## Ikastaroaren laguntzaile espezifikoak



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



# Programa

## 2016-06-20

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

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## 2016-06-21

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

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## 2016-06-22

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

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## 2016-06-23

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

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## 2016-06-24

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

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## 2016-06-27

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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## 2016-06-28

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

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**2016-06-29**

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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**2016-06-30**

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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**2016-07-01**

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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## Zuzendaritza



**Ainhoa Iniguez Goizueta**

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# **Kokalekua**

## **Bilboko Ingeniaritza Goi Eskola Teknikoa**

Urkixo zumardia, z/g. 48013-Bilbo

Bizkaia