Physics and Informatics – Interconnections

2023.03.06. SPRING SEMESTER

Physics knowledge is very important and can be very helpful for students who get their diploma as computer scientists. Having physics background knowledge helps to get much better jobs – like those needed for ex. for developing Galileo – the European correspondent of GPS, or to work for CERN, in the area of remote sensing and so on.

Course hours: 2h/week;

Presence: ¾ of the classes;

Exam: oral,

 - instead you can make a presentation which will be discussed during the class;

MATERIAL TO BE COVERED:

1.) - Image forming instruments:

 – the camera and the Lytro camera - comparison and short overview

2.) - The Lytro camera - the physics and informatics behind it;

3.) - Ray Optics; The laws of Reflection and refraction

4.) - Reflection by plane and spherical mirrors;

5.) - The laws of refraction; Total internal reflection

6.) - Refraction by spherical surfaces

7.) - Thin lenses

8.) - Different optical instruments: microscope, telescope etc.;

9.) - Electricity – basics; Static electricity;

10.) - Coulomb’s law; The Electric field;

11.) - Electric fields and conductors; Electric dipoles;

12.) - Capacitors; Capacitors in series and parallel;

13.) - Electric Current – Ohm’s law; Resistors in series and parallel;