# **Physics Laboratory 2**

- 1. Course number and name: 020PP2CI3 Physics Laboratory 2
- 2. Credits and contact hours: 2 ECTS credits, 1x1:15 contact hours
- **3.** Name(s) of instructor(s) or course coordinator(s): Joseph Kesserwani, Danielle Hajj, Elias Mechref, Elie Hleihel, Robert Farha.
- 4. Instructional materials: Lab experiments Lab manual

#### 5. Specific course information

a. Catalog description:

This course allows students to solidify their theoretical knowledge by putting it into practice through a variety of topics. They will have the opportunity to explore areas such as electrical circuits, linear filters, Fourier analysis, frequency analysis, the Thomson tube, thermal conduction, the Stefan-Boltzmann law, the pulsograph (oscillator with two degrees of freedom), diffraction and interference, as well as polarization.

- **b. Prerequisites:** 020PP1CI2 Physics Laboratory 1
- c. Required/Selected Elective/Open Elective: Required

### 6. Educational objectives for the course

### a. Specific outcomes of instruction:

- Apply theoretical knowledge and develop practical skills.
- Manipulate and understand electrical circuits with components such as differentiators, adders, and subtractors.
- Master the basic concepts of linear filters in electrical circuits.
- Acquire skills in Fourier analysis, a fundamental technique for decomposing a signal into its frequency components.
- Experiment with the Thomson tube, a device used to study the motion of charged particles in an electromagnetic field.
- Study thermal conduction in various materials and structures.
- Understand the Stefan-Boltzmann law, which describes the thermal radiation emitted by a body.

#### b. PI addressed by the course:

PI	5.2	6.1	6.2	6.3	6.4
Covered		Х	Х	Х	Х
Assessed	Х	Х	Х	Х	Х

## 7. Brief list of topics to be covered

- Electric Circuit Differentiator/Adder/Subtractor Stefan-Boltzmann Law (2 lectures)
- Linear Filter Pulsograph: Two-Degree-of-Freedom Oscillator (2 lectures)
- Fourier Analysis Diffraction and Interference (2 lectures)
- Frequency Analysis Polarization (2 lectures)
- Thomson Tube (2 lectures)
- Thermal Conduction (2 lectures)