

## ***Physics Laboratory 2***

- 1. Course number and name:** 020PP2NI3 Physics Laboratory 2
- 2. Credits and contact hours:** 2 ECTS credits, 1x1:15 contact hours
- 3. Name of course coordinator:** 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 :** 020PP1NI2 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:**

<b>PI</b>	<b>5.2</b>	<b>6.1</b>	<b>6.2</b>	<b>6.3</b>	<b>6.4</b>
<b>Covered</b>		x	x	x	x
<b>Assessed</b>	x	x	x	x	x

**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)