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(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:** 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:**

PI	5.2	6.1	6.2	6.3	6.4
Covered		x	x	x	x
Assessed	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)