Course Syllabus

1. **Course number and name:** 020PHQCI4 Quantum physics
2. **Credits and contact hours:** 2 ECTS credits, 1x1:15 course hours
3. **Instructor's or course coordinator's name:** Rémi Z. DAOU
4. **Text book:** *Physique tout-en-un MP, Salamito, J'intègre-Dunod, 2014*
5. **Specific course information**
    a. **Catalog description:** this course is concerned with tow aspects of modern physics. The first based on the Schrodinger formulation of the wave mechanics and is treat simple but fundamental problems: free particle, particle in a single-step potential, tunnel effect, particle in a box and energy quantification. The second is an introduction to statistical thermodynamics where macroscopic properties of a system are to be related to its microscopic constituents. The Boltzmann factor is introduced for the isothermal atmosphere model then generalized to systems with a discreet spectrum of energy. Equipartition theorem is then used to evaluate heat capacity of gases and solids.
    b. **prerequisites or co-requisites:** 020EMECI3 Electromagnetism
    c. **Required/Elective/Selected Elective:** Required
6. **Specific goals for the course**
    a. **Specific outcomes of instruction:**
        - Relate quantum effects to classical predictions
        - Use knowledge of waves to understand quantum phenomena
        - Predict quantum effects from numerical estimations
        - Ability to go from a corpuscular representation to wave representation
        - Use superposition principal
        - Relate macroscopic quantities to microscopic parameters
        - Implement statistical and approaches in evaluating physical quantities
        - Relate systems with a discreet spectrum of energy to quantification
    b. **KPIs addressed by the course:**

KPI	a1	a2	b1	b2	b3
Covered	x				
Assessed	x				
Give Feedback	x				

7. **Brief list of topics to be covered and approximate number of lectures:**
    1. Introduction to quantum mechanics (4 lectures)
    2. Evolution of a free particle (3 lectures)
    3. Evolution of a particle in a potential (4 lectures)
    4. Elements of statistical thermodynamics (3 lectures)