

Course Description Form

1. Course Name: Atomic Physics	
2. Course Code:	
3. Semester / Year:1-2 2025/2026	
4. Description Preparation Date:2025-2026	
5. Available Attendance Forms: Daily attendance	
6. Number of Credit Hours (Total) / Number of Units 2 Hours (Total) 30 week	
7. Course administrator's name (mention all, if more than one name)	
name: ALI SAEED HMEED email :ali.saeed@moheer.gov.iq	
Course Objectives .8	
Course Objectives	<hr/> <p>The course objectives include a description of the subject, the purpose of studying it, and the philosophy of its teaching. This course aims to study the principles of physics, the most important physical laws, and the importance of understanding and classifying these laws. It also focuses on the role of atomic physics in human life and in nature.</p> <p>Furthermore, the course includes the study of hypotheses and theories that explain the role of the atom in the formation of matter.</p>
9. Teaching and Learning Strategies	
Strategy	<ol style="list-style-type: none"> 1. Education Strategy Collaborative Concept Planning 2- Brainstorming education strategy. 3. Education Strategy Notes Series 4- Presentation, training, discussion research and reports
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge	Atomic Physics and the Components of the Atom	Use the whiteboard display	Daily exam and oral questions
2	2	Knowledge	<ul style="list-style-type: none"> • Radioactive Decay • Radioactive Materials • Radioactivity • Half-life 	Use the whiteboard display	Daily exam and oral questions
3	2	Knowledge	<ul style="list-style-type: none"> • Types of Radiation • Alpha Particles • Beta Particles • Gamma Rays • Decay Models 	Use the whiteboard display	Daily exam and oral questions
4	2	Knowledge	<ul style="list-style-type: none"> • Classification of Radiation • Electromagnetic Radiation • Particulate Radiation • Ionizing and Non-ionizing Radiation • Electromagnetic Energy • Velocity and Amplitude • Frequency and Wavelength. 	Use the whiteboard display	Daily exam and oral questions
5	2	Knowledge	<ul style="list-style-type: none"> • Wave Model: Visible Light • Particle Model: Quantum Theory • Matter and Energy • Interactions of Photons with Matter • Mechanisms of Energy Loss • Photoelectric Effect 	Use the whiteboard display	Daily exam and oral questions

6	2	Knowledge	<ul style="list-style-type: none"> • Photon Attenuation Coefficients • Linear Attenuation Coefficient • Exponential Attenuation • Mass Attenuation Coefficient • Energy Absorption Coefficient 	Use the whiteboard display	Daily exam and oral questions
7	2	Knowledge	<ul style="list-style-type: none"> • Photon Attenuation Coefficients • Linear Attenuation Coefficient • Exponential Attenuation • Mass Attenuation Coefficient • Energy Absorption Coefficient. 	Use the whiteboard display	Daily exam and oral questions
8	2	Knowledge	Interactions of Electrons with Matter	Use the whiteboard display	Daily exam and oral questions
9	2	Knowledge	<ul style="list-style-type: none"> • Introduction to Nanomaterials • Properties of Nanoparticles • Types of Nanoparticles 	Use the whiteboard display	Daily exam and oral questions
10	2	Knowledge	<ul style="list-style-type: none"> • Synthesis Methods • Bottom-Up Approaches • Top-Down Approaches • Applications of Nanomaterials in Medicine and Biology 	Use the whiteboard display	Daily exam and oral questions
11	2	Knowledge	<ul style="list-style-type: none"> • Nanotechnology in Renewable Energy Systems • Energy Transfer, Conversion, and 	Use the whiteboard display	Daily exam and oral questions

			Storage (at Nano-, Micro-, and Meso-Scales) <ul style="list-style-type: none"> • Energy Sector Products Using Nanomaterials 		
12	2	Knowledge	<ul style="list-style-type: none"> • Nanotechnology for Hydrogen Production • Photolysis of Water 	Use the whiteboard display	Daily exam and oral questions
13	2	Knowledge	<ul style="list-style-type: none"> • Nanomaterials for the Conversion of Carbon Dioxide into Renewable Fuels and Value-Added Products 	Use the whiteboard display	Daily exam and oral questions
14	2	Knowledge	<ul style="list-style-type: none"> • Nanomaterials and Direct Air Capture of Carbon Dioxide • Capture or Separation Technologies • Modern Methods for CO₂ Capture: Direct Air Capture and Nanomaterials 	Use the whiteboard display	Daily exam and oral questions
15	2	Knowledge	<ul style="list-style-type: none"> • Solar Energy Technology • Availability of Solar Radiation • Photovoltaic Devices • Dye-Sensitized Solar Cells • Photoelectrochemical Cells for Hydrogen Production 	Use the whiteboard display	Daily exam and oral questions

	<ul style="list-style-type: none">• Modern Physics by Kenneth S. Krane<ul style="list-style-type: none">• Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles by Robert Eisberg and Robert Resnick
Electronic References, Websites	ncbi,google scholar,researchgate