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**Department of Physics**

**College of Education**

**Salahaddin University-Erbil**

**Subject: Modern Physics Lab.**

**Course Book: Year Third**

**Lecturer's name: Dr. Glara Fuad Hasan**

 Dr. Asaad Hamid Ismail

 Dr. Hiwa Hamad Azeez

Mrs Avin Jawhar Ali

Mrs Raz Waly Ali

**Academic Year: 2023-2024**

**Course Book**

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| **1. Course name** | **Modern Physics Lab.** |
| **2. Lecturer in charge** |  Dr. Asaad Hamid Ismail  Dr. Hiwa Hamad Azeez Dr.Glara Fuad HasanMrs Avin Jawhar Ali Mrs Raz Waly Ali |
| **3. Department/ College** | **Physics/ Education** |
| **4. Contact** | **e-mail:** **gelara.hassan@su.edu.krd** |
| **5. Time (in hours) per week**  | **Theory: 6 hrs.**  |
| **6. Office hours** | Sunday & Monday: 8:30-12:30 |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | For finding the teacher's academic profile of the lecturer members of Modern Lab. see the academic staff website by using the following link: <https://academics.su.edu.krd/#2> |
| **9. Keywords** |  |
| **10. Course overview:**  A laboratory course that explores the foundations of quantum physics through laboratory experiments. The experimental observations provide evidence for the quantization of energy levels and wave-particle duality. Some other experiments illustrate the hall effect in metal and semiconductors. |
| **11. Course objective:** By the end of the course, students will be able to: 1. Recognize the methods of laboratory technique and analysis; 2. Recognize the relationship of experimentation to the growth and development of scientific theories; 3. Describe, discuss, and perform experiments in modern physics; 4. Interpret the results of experiments and demonstrations of physical principles; 5. Prepare a lab report according to accepted norms. |
| **12. Student's obligation** In the lab., the experiments are illustrated through ordinary methods (white blackboards) and discussions.  |
| **13. Forms of teaching** Illustration of experiments theory in the first Lab. time. Experiments will be explained by using general discussion each one per week, and individual discussions with students during their experiments. |
| **14. Assessment scheme** final degree will form from:1. Report per week

2. Presenting an experiment per week for two students 3. Individual discussing students per week 4. General lab. Practice examine. 5. Theory/lab. examination |
| **15. Student learning outcome:****After successful completion of the courses, the students learns:*** The methods of laboratory technique and analysis
* The relationship of experimentation to the growth and development of scientific theories;
* Describe, discuss, and perform experiments in modern physics
* Interpret the results of experiments and demonstrations of physical principles
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| **16. Course Reading List and References‌:**1. Laboratory Manual 2. Internet resources.
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| **17. The Topics:** | **Lecturer's name** |
| 1. First semester Experiments:

1. Microwave Wavelength measurement2. Study of Stefan-Boltzmann’s law of radiation3. Specific charge of electron (e/m0) measurement4. The Study of Electron Diffraction6. Balmer series / Determination of Rydberg’s constant7. Zeeman Effect1. Second-semester Experiments
2. Microwave power and attenuation Measurements
3. Diffraction of microwaves
4. Transmission and absorption coefficient of Microwaves
5. Band gap of germanium
6. Hall Effect in n-germanium
7. Hall Effect in metals
8. The Study of X-rays Characteristics of copper
 |  Dr. Asaad Hamid Ismail  Dr. Hiwa Hamad Azeez Dr.Glara Fuad HasanMrs Avin Jawhar Ali Mrs Raz Waly Ali |
| **18. Practical Topics (If there is any)** |  |
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| **19. Examinations:***1. Report* 2. Individual discussion 3. General Lab. Exam. 4. Theory/Practice Exam. |
| **20. Extra notes:** There are too many unnecessary holidays that reduce topics given to students.  |
| **21. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ**  |