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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 Hasan  Mrs Avin Jawhar Ali  Mrs Raz Waly Ali | |
| **3. Department/ College** | **Physics/ Education** | |
| **4. Contact** | **e-mail:** [**gelara.hassan@su.edu.krd**](mailto: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 | | |
| **16. Course Reading List and References‌:**   1. Laboratory Manual 2. Internet resources. | | |
| **17. The Topics:** | | **Lecturer's name** |
| 1. First semester Experiments:   1. Microwave Wavelength measurement  2. Study of Stefan-Boltzmann’s law of radiation  3. Specific charge of electron (e/m0) measurement  4. The Study of Electron Diffraction  6. Balmer series / Determination of Rydberg’s constant  7. Zeeman Effect   1. 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 Hasan  Mrs 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** | | |