Form: Course Syllabus		
	Form Number	EXC-01-02-02A
	Issue Number and Date	2963/2022/24/3/2 5/12/2022
	Number and Date of Revision or Modification	2/(10/12/2023)
	Deans Council Approval Decision Number	50/2023
	The Date of the Deans Council Approval Decision	26/12/2023
	Number of Pages	06

1.	**Course Title**	Modern Physics Lab
2.	**Course Number**	0302315
3.	**Credit Hours (Theory, Practical)**	(0,2)
	Contact Hours (Theory, Practical)	(0, 6)
4.	**Prerequisites/ Corequisites**	Modern Physics (0302261), Practical Physics-3 (0302215)
5.	**Program Title**	Physics
6.	**Program Code**	2
7.	**School/ Center**	Science
8.	**Department**	Physics
9.	**Course Level**	3ed year
10.	**Year of Study and Semester (s)**	2024-2025, Second Semester
11.	**Other Department(s) Involved in Teaching the Course**	None
12.	**Main Learning Language**	English
13.	**Learning Types**	■Face to face learning ☐Blended ☐Fully online
14.	**Online Platforms(s)**	☐Moodle ☐Microsoft Teams
15.	**Issuing Date**	27/2/2025
16.	**Revision Date**	10/6/2025

17. Course Coordinator:

Name: Sami Mahmood Contact hours: 1:00 – 7:00 PM

Office number: Rm 17 Phone number: 22023

Email: s.mahmood@ju.edu.jo

18. Other Instructors:

Name:
Office number:
Phone number:
Email:
Contact hours:
Name:
Office number:
Phone number:
Email:
Contact hours:

19. Course Description:

At least ten experiments each of six hours per week from the following list: Frank-Hertz experiment; Thermionic emission; The characteristics of Geiger-Muller counter and the absorption of radiation; Statistical nature of nuclear radiation; Millikan's oil-drop experiment; Mechanical oscillator; Photoelectric effect; Measurements of dielectric constants of liquids; Hall effect in a conductor; Diffraction grating and Balmer series; Electron diffraction; Magnetic susceptibility; Black-Body radiation using Thermionic emission.

20. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

SO1: Identify, formulate, and solve broadly-defined technical or scientific problems by applying knowledge of Mathematics and Science and/or technical topics to areas relevant to the discipline.

SO2: Formulate or design a system, process, procedure or program to meet desired needs.

SO3: Develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.

SO4: Communicate effectively with a range of audiences in oral or written forms and exhibit ethical and professional values.

SO5: Reflect the impact of technical and/or scientific solutions in economic, environmental, and societal contexts.

SO6: Function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

21. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

CLO1. Explain the concepts and physics relevant to the various experiments in modern physics.

CLO2. Perform precise measurements of basic quantities relevant to experiments in modern physics.

CLO3. Organize the experimental results in tables and graphical representations.

CLO4. Analize the experimental data using proper techniques and software packages.

CLO5. Write a professional scientific report for each experiment.

CLO6. Collaborate with teammates in the experimental work and data analysing.

Course ILOs	**The learning levels to be achieved**					
	Remembering	**Understanding**	**Applying**	**Analysing**	**evaluating**	**Creating**
CLO1	✓	✓		✓		
CLO2			✓			
CLO3				✓		✓
CLO4				✓		
CLO5				✓	✓	✓
CLO6		✓			✓	

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program ILOs / CLOs	SO (1)	SO (2)	SO (3)	SO (4)	SO (5)	SO (6)
CLO1	✓	✓		✓		✓
CLO2			✓	✓		✓
CLO3			✓			
CLO4		✓	✓			
CLO5				✓		
CLO6						✓

23. Topic Outline and Schedule:

Week	Lecture	Topic	ILO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
2		Introduction to lab						
3 - 12		Discuss an experiment, perform Measurements, Analize data, and deliver a scientific report for each experiment	CLO1 to CLO6	Face to face			Oral evaluation, and report grading	Lab manual, Experiments in Modern Physics (Melissinos), Experimental equipment, Computers and software
13		Makeup week		Face to face				
15		Final Exam	CLO1, CLO3, CLO4	Face to face			Exam	

24. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	ILO/s Linked to the Evaluation activity	Period (Week)	Platform

Oral evaluation	30%	All experiments	CLO1, CLO4, CLO6	Every week	
Lab reports and Log book	30%	All experiments	CLO1 to CLO5	Every week	
Final Exam	40%		CLO1, CLO3 and CLO4	End of semester	

25. Course Requirements:

(e.g.: students should have a computer, internet connection, webcam, account on a specific software/platform…etc.):

Each of the mentioned experiments has its full setup as described in the lab manual.

Each student should have access to a computer with proper software for data analysis, and internet connection.

Each student should have an account on Microsoft Teams

26. Course Policies:

A- Attendance policies: Students should attend all lab sessions. With an acceptable excuse, a student may miss one lab session at most, and should perform the missed experiment in the makeup week.

B- Absences from exams and submitting assignments on time: No late assignments are accepted. Absence from the final exam should be justifiable, in which case an alternative evaluation and a makeup exam will be offered.

C- Health and safety procedures: Safety measures should be followed during all lab sessions. High voltage equipment and radioactive sources are monitored during the lab session.

D- Honesty policy regarding cheating, plagiarism, misbehavior: all students are expected to have the highest levels of honesty and plagiarism is not tolerated in any of the lab reports.

E- Grading policy: Every student will be able to see his/her oral evaluation grade, and the graded reports are returned to students soon after submission.

F- Available university services that support achievement in the course: A fully furnished lab with technical support and computer facility for data analysis is available for the students.

27. References:

A- Required book(s), assigned reading and audio-visuals:

Lab manual: Advanced Practical Physics, Sami Mahmood (2012), The University of Jordan

B- Recommended books, materials, and media:

[1] University Laboratory Experiments Physics, Vol. 1 – 5, 3rd ed., PHYWE series of publications, (PHYWE SYSTEME GMBH, Gottingen, Germany, 1995).
[2] Adrian C. Melissinos, Experiments in Modern Physics, (Academic Press, New York, 1966).
[3] Philip R. Bevington and D. Keith Robinson, Data Reduction and Error Analysis for the Physical Sciences, 3rd ed., (McGraw-Hill, Boston, 2003)

*Modern Physics textbooks

*C. Kittel, Introduction to Solid State Physics

* D. J. Griffiths, Introduction to Quantum Mechanics.

*YouTube and internet resources.

28. Additional information:

Name of the Instructor or the Course Coordinator: Sami H. Mahmood	Signature: Sami mahmood	Date: 27/2/2025
Name of the Head of Quality Assurance Committee/ Department	Signature:	Date:
…….	……..……	……..……
Name of the Head of Department	Signature:	Date:
…….	……..……	……..……
Name of the Head of Quality Assurance Committee/ School or Center	Signature:	Date:
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Name of the Dean or the Director	Signature:	Date:
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