

مختصر توصيف المقرر

:(Course Information)

معلومات المقرر \*

|                       |                           |                        |
|-----------------------|---------------------------|------------------------|
|                       | اسم المقرر:               | مختبر الفيزياء الحديثة |
|                       | رقم المقرر:               | فيز 3932               |
|                       | اسم ورقم المتطلب السابق:  | فيز 2512               |
|                       | اسم ورقم المتطلب المرافق: | --                     |
|                       | مستوى المقرر:             | الخامس                 |
|                       | الساعات المعتمدة:         | 2 (0+4+0)              |
| <b>Module Title:</b>  | Modern Physics Lab.       |                        |
| <b>Module ID:</b>     | PHYS 3932                 |                        |
| <b>Prerequisite :</b> | PHYS 2512                 |                        |
| <b>Co-requisite :</b> | --                        |                        |
| <b>Course Level:</b>  | Fifth                     |                        |
| <b>Credit Hours:</b>  | 2 (0+4+0)                 |                        |



Module

وصف المقرر :

Description

The Balmer series of hydrogen and determination of Rydbergs constant, Franck- Hertz experiment, characteristics of microwaves, Milikan oil drop, Kerr effect, Faraday effect, Pockels effect, Zeeman effect, Planck's constant, Studying X-ray spectra.

أهداف المقرر :

Module Aims

|   |   |   |
|---|---|---|
| 1 | To thoroughly understand the physical principles by applying it experimentally.   | 1 |
| 2 | To improve the experimental skills in dealing with the equipment, and to motivate the student for research and discovery. | 2 |
| 3 | Improve the skills of data analysis.  | 3 |

Learning

مخرجات التعليم:

Outcomes:

|   |  |   |
|---|--|---|
| 1 | <b>Knowledge</b><br>Knowing the basic phenomena of modern physics and learns how to calculate the physical quantities related to the experiment and compare it with literature.  | 1 |
| 2 | <b>Cognitive Skills</b> <ul style="list-style-type: none"> <li>To perfect the skills of operating and reading from the instruments.</li> <li>To learn the accuracy and caution when operating an instrument.</li> <li>To perfect the research skills.</li> <li>To perfect the skills of results evaluation and searching for possible errors.</li> </ul> | 2 |

|          |   |          |
|----------|---|----------|
| <b>3</b> | <b>Interpersonal Skills and Responsibility</b> <ul style="list-style-type: none"> <li>The skills of self-dependency and helping the others.</li> <li>Learning the group work and developing the team spirit.</li> <li>Practicing the discussion with the others and exchange the different point of views.</li> <li>Take the responsibility of taking care of the instruments and the public properties.</li> </ul> | <b>3</b> |
| <b>4</b> | <b>Communication, Information Technology and Numerical Skills</b> <ul style="list-style-type: none"> <li>The skill of analyzing the data manually.</li> <li>The skill of using the computer to analyze the data.</li> <li>The skill of dealing with the software operating the instruments.</li> <li>The skill of searching the internet.</li> </ul>  | <b>4</b> |
| <b>5</b> | <b>Psychomotor</b><br>Not applicable.   | <b>5</b> |

**Course Contents:**

**محتوى المقرر:**

| ساعات التدريس<br>(Hours) | عدد الأسابيع<br>(Weeks) | قائمة الموضوعات<br>(Subjects)                                   |
|--------------------------|-------------------------|---|
| 4                        | 1                       | Training on using Excel and/or Origin softwares to process data |
| 8                        | 2                       | Photoelectric effect and Planck's constant determination        |
| 4                        | 1                       | Milikan oil drop experiment<br>تجربة ميليكان لنقطة الزيت        |
| 4                        | 1                       | Balmer series and Rydberg's constant determination              |
| 4                        | 1                       | Zeeman effect<br>تجربة تأثير زيمان                              |
| 8                        | 2                       | Surface tunneling effect  |
| 4                        | 1                       | Moseley's law using x-ray machine                               |
| 4                        | 1                       | Energy spectrum of certain materials using x-ray machine        |
| 4                        | 1                       | Effect of voltage and current on the XRD pattern                |
| 4                        | 1                       | Seminar<br>سيمنار   |
| 4                        | 1                       | Substitution week<br>أسبوع التعويض                              |
| 4                        | 1                       | Final exam<br>الاختبار النهائي                                  |

**Textbook and References:**

**الكتاب المقرر والمراجع المساندة:**

| سنة النشر<br>Publishing Year    | اسم الناشر<br>Publisher | اسم المؤلف (رئيسي)<br>Author's Name                   | اسم الكتاب المقرر<br>Textbook title |
|---------------------------------|-------------------------|---|-------------------------------------|
|                                 |                         |   | Lab. Manual                         |
| سنة النشر<br>Publishing Year    | اسم الناشر<br>Publisher | اسم المؤلف (رئيسي)<br>Author's Name                   | اسم المرجع<br>Reference             |
| 3 <sup>rd</sup> edition, (2012) | Wiley                   | K. Krane;   | Modern Physics                      |
| 3 <sup>rd</sup> edition, (2004) | Brooks Cole             | Raymond A. Serway, Clement<br>J. Moses, Curt A. Moyer | Modern Physics                      |

