مواصفات مقرر ميكانيكا كم (1)

- **البرنامج الذي يقدم المقرر من خلاله** (إعداد معلم الفيزياء)
- **يمثل المقرر عنصرا (**رئيسيا **) بالنسبة للبرنامج**
- **القسم العلمي المسئول عن البرنامج (**متعدد**)**
- **القسم العلمي المسئول عن تدريس المقرر (**قسم الفيزياء**)**
- **السنة الدراسية / المستوى (**الفرقة الثالثة عام. شعبة الطبيعة والكيمياء / الفصل الدراسى الأول**)**
- **تاريخ اعتماد توصيف البرنامج ( )**

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Basic Data بيانات أساســـية

1) **العنـــــــــوان : ميكانيكا الكم (1)**
2) **الكـــــــــود : 313 ph**
3) **الساعات Two credit hours**

- **المحاضـــــــــرة: 2 h lect. /w**
- **الدروس العمليـــــــة: -**
- **المجمـــــــــوع: 2 credit hours**

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بيانات مهنيــة

(1) الأهداف العامة للمقرر:

- **The course is designed to help student-teachers achieve the following goal:**

1.1 Building a solid foundation for advanced nuclear physics course
1.2 Building a solid foundation for follow – on converses in atomic, nuclear and solid state physics.

2) Operational learning objectives of the course (2) الأهداف الإجرائية للمقرر

By the end of this course, student teachers are expected to achieve the following objectives:

A) Knowledge and Comprehension: أ- المعرفة والفهم:

The student have to recognize the following:

a.1 The early researches for measuring nuclear dimensions, charges and masses.
a.2 The natural radioactivity and the laws governing it
a.3 Lagrange's & Hamiltons formulations of mechanics.
a.4 Black body radiation and Planck's hypothesis.

B) Cognitive Skills: ب- المهارات العقلية:

b.1 Postulates of Q. Mech. And the solution of one dimensional problems for different potential configuration.

C) Practical Skills: **جـ- المهارات العملية:**

c.1 The constituents of the nucleus.

c.2 Photo- electric effect, De-Broglie hypothesis and Heisenberg uncertainty principle.

D) Enabling Skills: **د- المهارات العامة والمنقولة:**

d.1 Construct new knowledge for themselves through research, reading and discussion, and reflect in an informed way on the role of science in human affairs.

d.2 Create and maintain an educational environment in which conceptual understanding will occur for all science students.

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Contents المحتويات

Week	Topic	Assigned hours		
		Lectures	Rec	Total
First Second Third	**I- Classical Mechanics:** • LaGrange's & Hamilton's formulation of Mechanics. • System of particles & Rigid bodies	6	-	6
Fourth Fifth Sixth	**II - Quantum Mechanics:** • Black body radiation & Plank's Hypothesis. • Photo electric effect and Einstien photon theory. • wave properties of particles (De- Broglie hypothesis) • Electron diffraction.	6	-	6
Seventh Eighth Ninth	• Heisenberg uncertainity principle. • Postulates of Q.Mech. • Hermition operators – space functions- Eigen functions, eigen values – operators.	6	-	6
Tenth Eleventh Twelfth Thirteenth	**III- Time independent Sch.eq.** **One dimensional problems:** • Free particles. • Free particle in a box. • Potential step (jump) • Potential well. • E- Tunnel effect	8	-	8

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Activities, tasks and assignments: **أساليب التعليم والتعلم**

- Solves and discusses problem sets.
- Submission and class presentation of term papers.

- Computer aided and web based assignments and assessment.
- Visits to industrial and medical institutions and submission of subsequent reports.
- Laboratory work, group discussions, and reports on: volumetric analysis, precipitation, complexometric and redox titrations
- Lectures.
- Laboratory experiments.
- Problems and essay assignments.

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Assessment and Evaluation tools: أساليب التقسم

- Semester activities including classroom interactions and Quizzes.
- Final exam.

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Summative Evaluation table **جدول التقسيم**

Assessment	Final exam	Fifteenth Week	الأسبوع الخامس عشر	نهاية الفصل الدراسي	**التقييم**

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النسبة المئوية لكل تقسم

Assessment	Score وزن الدرجة Weight	التقييم
1. Midterm exam	**-**	**1. امتحان نصف الفصل الدراسي**
2. Final written exam	**%80**	**2. امتحان نهاية الفصل الدراسي**
3. Final practical exam	**-**	**3. الامتحان العملى**
4. assignments	**%20**	**4. أعمال السنة**
Total	**%100**	**المجموع**

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قائمة المراجع

(1) كتب المحاضر

- Computer simulation programs and slides.
- Transparences.
- Manual of solved problems (answer and solutions)
- **Text books:**

- Quantum physics by Eisberg and Resnick.
- Modern physics and quantum mechanics by Anderson

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الإمكانات المطلوبة للتعليم والتعلم

- References
- Textbooks
- Handouts and problem sets.
- Electronic, web, and multimedia based resources.
- Lab work.

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- **منسق المقرر:**
- **رئيس القسم:**
- **التـــــاريخ:**