

(المعرفة والمهارات والكفايات)

يفترض بالطالب بعد دراسته لهذا المساق أن يكون قادرا على:

After completing this course, the student should demonstrate the knowledge and ability to:

After finishing this course, students will be able to understand and apply the concepts quantum mechanics to tackle common problems in chemistry, including spectroscopy.

5. السياسة العامة والحضور (Course Policies: Attendance Policy)

Course participants are expected to master the material from Calculus I and II.

1. This course will require weekly problem sets. A thorough understanding of each problem set will help you master the concepts.
2. The course will have two exams plus a final exam.
3. Classes will involve hands-on worksheets to summarize key ideas/results and to practice new material. Participating in the in-class exercises will help you master the concepts.
4. Students will be expected to prepare course material as indicated in reading assignments.
5. It is your responsibility to get copies of the lecture & recitation material
6. **Attendance at all classes will be recorded and is mandatory.** Please make sure you read and fully understand the University of Al Al Bayte Attendance Policy. This policy will be strictly enforced.

تنبيه: في حال التغيب عن اي امتحان لن يكون هناك امتحان تعويضي الا في حالة وجود عذر و حالة طارئة من المستشفى و على الطالب ابراز العذر في فترة لا تتجاوز الثلاثة ايام مه تاريخ الامتحان, و للمدرس الحق في قبول او رفض العذر، و حسب التعليمات

6. محتوى المساق (Course Content)

الموضوع	الأسبوع
Classical physics and Quantum Mechanics	الأول
The Schrodinger Equation	الثاني

The Quantum Mechanical Postulates	الثالث
The Schrodinger Equation	الرابع
Using Quantum Mechanics on Simple systems	الخامس
The Particle in A box	السادس
الامتحان الأول	
The Harmonic Oscillator system	الثامن
The Harmonic Oscillator system	التاسع
A Quantum Mechanical Model for the Vibration and Rotation of Molecules	العاشر
A Quantum Mechanical Model for the Vibration and Rotation of Molecules	الحادي عشر
الامتحان الثاني	
Quantum Mechanics of Hydrogenlike Atoms	الثالث عشر
Physical Significance of the Orbital Quantum Numbers	الرابع عشر
The Hydrogen Molecular-Ion, H ₂ ⁺	الخامس عشر

Foundations of Chemical Spectroscopy	السادس عشر
	الامتحان النهائي

1. استراتيجيات التعليم والتعلم وطرق التقويم
(Teaching and learning Strategies and Evaluation Methods)

ت	مخرجات التعلم	استراتيجيات التدريس	أنشطة التعلم	نوع التقويم/القياس (امتحان/عروض صفية/مناقشة/واجبات)
1	Understand the needs of quantum mechanics.	Lecture, Presentation, quizzes, Case studies, and in class questions	Class notes - Problem sets and solutions Class Discussions, website development	In class Questions, Presentation, Exam
2	Understand basic concepts of quantum mechanics	Lecture, Presentation, quizzes, Case studies, and in class questions	Class notes - Problem sets and solutions Class Discussions, website development	In class Questions, Presentation, Exam
3	Understand basic concepts of Schrodinger equation.	Lecture, Presentation, quizzes, Case studies, and in class questions	Class notes - Problem sets and solutions Class Discussions, website development	In class Questions, Presentation, Quizzes, Exam
4	Understand basic concepts of Particle in a box	Lecture, Presentation, quizzes, Case studies, and in class questions	Class notes - Problem sets and solutions Class Discussions, website development	In class Questions, Presentation, Quizzes, Exam
5	Understand basic concepts of the application of particle in a box in spectroscopy	Lecture, Presentation, quizzes, Case studies, and in class questions	Class notes - Problem sets and solutions Class Discussions, website development	In class Questions, Presentation, Quizzes, Exam
6	Understand basic concepts of vibrational spectroscopy	Lecture, Presentation, quizzes, Case studies, and in class questions	Class notes - Problem sets and solutions Class Discussions, website development	In class Questions, Presentation, Quizzes, Exam
7	Understand basic concepts of rotational spectroscopy	Lecture, Presentation, quizzes, Case studies, and in class questions	Class notes - Problem sets and solutions Class Discussions, website development	In class Questions, Presentation, Quizzes, Exam
8	Understand basic concepts of Bonding	Lecture, Presentation, quizzes, Case	Class notes - Problem sets and solutions Class Discussions,	In class Questions, Presentation, Quizzes, Exam

	website development	studies, and in class questions		
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1. تقييم الطلبة (Assessment)

توزيع الدرجات لكل أسلوب	توقيت التقييم	الأساليب المستخدمة
-	خلال الفصل	1- أعمال الفصل: (تقرير، وظائف، حضور)
25	الأسبوع السابع	2- امتحان تحريري أول
25	الأسبوع الثاني عشر	2- امتحان تحريري ثاني
50	أسبوع الامتحانات النهائية	3- امتحان تحريري نهائي

2. الكتاب المقرر (Text Book)

Physical Chemitry	المرجع الرئيس
Atkins	المؤلف
Oxford press	الناشر
2017	السنة
11 edition	الطبعة
https://oup-arc.com/access/pchem11e	الموقع الالكتروني للمرجع

3. المراجع الإضافية (References) (وتشمل الكتب والبحوث المنشورة في الدوريات او المواقع الالكترونية)

Physical Chemistry” by Thomas Engel and Philip Reid, 3rd edition. Pearson Prentice Hall, 2011 The companion website corresponding to this publisher is: http://wps.pearsoned.co.uk	-1
Physical Chemistry” K. J. Laidler and J.H. Meiser, 3rd Edition, Houghton Mifflin Company, 1998.	-2