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|  | **Mutah University**  **Detailed Syllabus Form** | Description: C:\Users\lamasat.lamasat-PC\Pictures\Picture1.png |

**First :** Course Information**:**

|  |  |
| --- | --- |
| * Course Number:0302751 | * Course Title: Quantum Mechanics I |
| * Credit Hours:3 | * College: Science |
| * Pre-requisite: | * Department: Physics |
| * Instructor: Dr. Emad Jaradat | * Semester&AcademicYear: First 2016/2017 |
| * the time of the lecture:2.00-5.00 | * Office Hours: Sun, Tues: 12-1 Mon, Wed: 10-11 |

**Second :** General Course Description

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| --- |
| This course covers the following topics: The hydrogen atom, interaction of electron with electromagnetic field, operators, matrices, spin, addition of angular momentum, time independent perturbation theory, the real hydrogen atom, the helium atom, structure of atom, the radiation of atom, scattering theory. |
|  |

**Third :** Course Objectives

* To Give a full solution to hydrogen atom
* To introduce new theories and concepts to attempt solving the hydrogen atom
* To show students how difficult to solve the helium atom, and methods to looks to the ground state energy of other atoms
* To study the radiation and scattering theory

**Fourth:** Expected Learning Outcomes

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**Fifth :** Course Plan Distribution & Learning Resources

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| --- | --- | --- |
| **Learning Resources** | **Topics to be Covered** | **Week**  **No.** |
| Ch1-ch8 | Review to quantum I |  |
| Chapter 9 | Schrodinger equation in three dimension |  |
| Chapter 10 | Angular Momentum |  |
|  |
| Chapter 11 | The Radial Equation |  |
|  |
| **Chapter 12** | The Hydrogen Atom |  |
| **Chapter 14** | Operators , Matrices and Spin |  |
|  |
|  |
| **Chapter 15** | Addition of Angular Momentum |  |
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|  |
| **Chapter 16** | Perturbation Theory |  |
| **Chapter 14** | Helium Atom |  |

**Sixth :** Teaching Strategies and Methods

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| --- | --- |
| **Teaching Strategies and Methods** | No |
|  | **1** |
|  | **2** |
|  | **3** |
|  | **4** |
|  | **5** |

**Seventh :** Methods of Assessment

|  |  |  |  |
| --- | --- | --- | --- |
| **Proportion of Final Evaluation** | **Evaluation Methods of** | **Week & Date** | **No.** |
|  |  |  | **1.** |
|  |  |  | **2.** |
|  |  |  | **3.** |
|  |  |  | **4.** |
|  |  |  | **5** |
|  |  |  | **6** |
| **(100%)** |  | **Total** | |

**Eighth :** Required Textbooks

Quantum physics, S Gasiorowics

**- Primary Textbook:**

An Introduction to quantum mechanics. By: Griffith Wiley

**-** **Secondary References**

**Ninth :** General Instructions

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| **Additional Notes, Office hours, Incomplete Exams, Reports, Papers, …etc** | **No** |
|  | **1** |
|  | **2** |
|  | **3** |
|  | **4** |
|  | **5** |