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**Department of Chemistry**

**College of Science**

**University of Salahaddin**

**Subject:** : Principle of the Applied Spectroscopy

**Course Book 4th Chemistry Student**

**Lecturer's name: Assist proof Dr. RounakMerzaShariffJaff**

**Academic Year: 2022-2023**

**Course Book**

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| **1. Course name** | **Quantum &Spectro Chemistry** |
| **2. Lecturer in charge** | **AsistproffDr.RounakMerzaShariffJaff** |
| **3. Department/ College** | **Chemistry/ Science** |
| **4. Contact** | **rounak.shariff@su.edu.krd** |
| **5. Time (in hours) per week**  | **2** |
| **6. Office hours** | **10 hours per week to the student during the week** |
| **7. Course code** | **4h** |
| **8. Teacher's academic profile**  | **I received my Bachelors B.SC of Science in Chemistry from Salahaddin University, Erbil-Iraq in 1988. From 1983-1988, I worked as a lab instructor at the Department of Chemistry; and also received Master of Science in Analytical Chemistry from Salahaddin University, Erbil-Iraq in 1994. Finally I received PH. D. of Science in PhysicalChemistry from Salahaddin University, Erbil-Iraq in 2008.Finally I upgraded to assist proffers in 2013.** |
| **9. Keywords** | **Physical Chemistry, Thermodynamics, equilibrium.** |
| **10. Course overview:****This course includes a detailed overview of physical aspect for the Molecular spectroscopy. Description the Pauli exclusion principle. The electronic structure of an atom the arrangement of electrons around a nucleus, and describe the structure of molecules too. Introduction the principles of chemical atomic structure, the study of parameter that affected on the spectra of atoms.** |
| **11. Course objective: Learning the student:*** **Prepare the chemical solution.**
* **Using the instruments and equipment.**
* **Plot the graph depending on specific laws.**
* **Compare and discuss practical and theoretical value.**
* **Writing report for each experiment**

**By showing how the spectroscopycan describe the internal structure of atoms and what we see about the experimental information is available from the study of the spectra of atoms.** |
| **12. Student's obligation****exams****literature Review**. |
| **13. Forms of teaching****Power point text, andwhite board** |
| **14. Assessment scheme*** .**literature Review 25%**
* .**Final Exams: There will be three closed book exams given throughout the semester. Each test will be scheduled for 90 minutes, 25%.**

**Final Exam: The Final Exam is Comprehensive in all course outlines** |
| **15. Student learning outcome:****Description the An understanding of spectroscopy is fundamental and essential to the study ofmaterials science, and an understanding of atomic stucture is fundamental to an understanding of atomic spectra.**  |
| **16. Course Reading List and References‌:**▪ **Physical chemistry, 4th Edition by N. Ira. Levin.** **Physical Chemistry, 6th Edition. By: ATKINS.** **Physical Chemistry, 2ed Edition. By: Gilbert W. Castellan.** **The Chemistry of molecular nature and change, 1st Edition. By: Martin berbeg.**▪ **Physical magazine and review from internet.** |
| **17. The Topics:** | **Lecturer's name** |
| 1st-Week: 1-1- Transitional motion  Examples.2nd -Week: 2-1 - Harmonic Oscillator, Examples. 2-2- Rotational motion3rd- Week: Spectroscopy:1.1. Introduction1.2. The visible Spectroscopy 1.3.3. Examples.4-5Week:4.1. Raman Spectroscopy5.2. Introduction.5.3. Examples :6th Week:6-1electronic Spectroscopy for atom.6-2- electronic Spectroscopy for a molecules7th Week: 6.1 Rotational Spectroscopy6.2Examples8th– 10thweek. 8.1vibrational Spectroscopy 8.2Examples10th– 11thweek. 12.1Rotational -vibrational Spectroscopy 12.2Examples12th–week. 12.1 NMR-Spectroscopy 12.2Examples13th–week.13th - e s r-Spectroscopy13-1 -Mass Spectroscopy13-2- Mose Bower Spectroscopy13-4 Leaser. | AsistproffDr.RounakMerzaShariffJaffex:(3hrs)ex:15`/1/2023 |
| **18. Practical Topics (If there is any)** |  |
| **If there is any** | AsistproffDr.RounakMerzaShariffJaffex:(3hrs)ex:3/4/2023 |
| ***Calculate the following***.***Drive the following******Explain the following.*** |
| **20. Extra notes: I will try to do my best to cover the course very well**. |
| **21. Peer review****I will try to do my best to cover the course very well**. |