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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 motion  3rd- Week: Spectroscopy:  1.1. Introduction  1.2. The visible Spectroscopy  1.3.3. Examples.  4-5Week:  4.1. Raman Spectroscopy  5.2. Introduction.  5.3. Examples :  6th Week:  6-1electronic Spectroscopy for atom.  6-2- electronic Spectroscopy for a molecules  7th Week:  6.1 Rotational Spectroscopy  6.2Examples  8th– 10thweek.  8.1vibrational Spectroscopy  8.2Examples  10th– 11thweek.  12.1Rotational -vibrational Spectroscopy  12.2Examples  12th–week.  12.1 NMR-Spectroscopy  12.2Examples  13th–week.  13th - e s r-Spectroscopy  13-1 -Mass Spectroscopy  13-2- Mose Bower Spectroscopy  13-4 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**. | | |