1. Course Syllabus

CHEM 424 Syllabus

Course Information

Course Code	Course Name	Credits	Prerequisite(s)	Classification
CHEM 424	Chemical Application of Group Theory	2	**CHEM 221 &CHEM 322**	**Elective Course**

Course Description

Definition and theorems of group theory, molecular symmetry and the symmetry point groups, representations of groups, matrices as representation of symmetry operations, construction of hybrid orbitals for sigma and pi-bonding, molecular vibrations, and assignments of vibrational using Infrared and Raman spectroscopy.

Class Scheduling:

Classes are held 2 times/week each for 50 minutes.

Textbook(s)

"Symmetry: An Introduction to Group Theory and Its Applications", R.McWeeny, H. Jones – 2013

Course Coordinator:

Dr. Amal Salmin Basaleh

Assessment Tools:

Week Due	Task	Score %
8	First Exam	20 %
12	Second Exam	20 %
During the semester	Homework during the course duration	20 %
14	Final Exam	40 %

Relationship to SOs

1	2	3	4	5	6
X	X				X

CLOs

CLO1. Recognize a theoretical background of group theory from the chemistry point of view. (SO1)

CLO2. Assign the point group and its symmetry operations, optical activities, and dipole moments by drawing their geometrical structures. (SO2)

CLO3. Construct the character tables for point groups. (SO2)

CLO4. Construct the hybrid orbitals on the central atom in a molecule or ion. (SO2)

CLO5. Predict the vibrational modes of molecules or ions and do vibrational assignments. (SO2)

CLO6. Interact effectively with students in resolving tasks and activities as a team. (SO6)

Contents

List of Topics	No. of Weeks
Definition and theorem of group theory.	2
Molecular point groups.	5
Representation of Groups	4
Construction of Hybrid Orbitals.	2
Molecular Vibrations.	2