

Department of Chemical Sciences

Graduate course, Spring 2021

SYMMETRY IN CHEMISTRY

Central Topics:

- Concepts of symmetry and broken symmetry in nature
- Symmetry elements, space groups and point groups
- Role of symmetry in physical properties
- Introductory group theory
- Representations of groups and character tables
- Symmetry aspects of electronic structure, molecular vibrations and chemical reactions

Suggested Text Books:

1. M. Ladd, *Symmetry of Crystal and Molecules*, Oxford University Press, 2014.
2. F. A. Cotton, *Chemical Applications of Group Theory*, Wiley Interscience, 3rd ed., 1990.
3. I. Hargittai and M. Hargittai, *Symmetry Through the Eyes of a Chemist*, VCH Publishers, 1987.
4. R. McWeeny, *Symmetry: An Introduction to Group Theory and its Applications*, Pergamon Press, 1963.

Prerequisites: Knowledge of matrix algebra and introductory quantum chemistry will be helpful.

Grading Policy: Assignments (30%), Midterm (35%), Final (35%).

Venue: AG66 or Zoom platform

Time: Tue, Thu 11:30 am – 1:00 pm,

Office Hours: Wed, Fri (12–1 pm) or set up an appointment via email

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First lecture on Mar 16th (Tuesday)