

**Chemistry 515: Structure and Bonding in  
Inorganic and Organometallic Chemistry  
4 units**

Prof. Richard Brutchey, Emily Roberts (Burg Teaching Fellow)  
Fall 2017  
(Lecture = 11:00-11:50 MWF, VKC 200)

CHEM 515 is a graduate level course in Inorganic Chemistry. The intent of this course is to give you a comprehensive picture of structure and bonding in Inorganic Chemistry. After a general discussion of the periodic table and periodic trends, the course will begin with a discussion of symmetry and group theoretical analysis. We will develop a detailed picture of structure and bonding of discrete inorganic molecules, with an emphasis being placed on the molecular orbital picture of bonding. Next, we will take these tools and extend them to an examination of structure and bonding in clusters and the solid state.

**Required Texts:** Cotton, *Chemical Applications in Group Theory*, 3rd ed.  
Burdett, *Chemical Bonds: A Dialog*.

**Supplemental Texts:** Hoffmann, *Solids and Surfaces: A Chemist's View of Bonding in Extended Structures*.

**Office/Contact:** RLB LJS 260 (brutchey@usc.edu) Office hours = by appointment.  
EJR LJS 265 (ejrobert@usc.edu) Office hours = by appointment.

**Grading\*:** Hour Exams (x3): 75% (tentatively set for 9/22, 10/27, and 12/1)  
Written Assignment: 25% (due December 8 at 5:00 pm)  
**\* There will be absolutely no make ups, extra time, or special arrangements given for any exams or projects without a documented medical excuse.**

**Outline:**

- I. Periodic Table & Periodic Trends
- II. Group Theory Analysis of Molecular Systems
- III. Application of Molecular Orbital Theory to Structure and Bonding in Inorganic Molecules, Clusters & Solids

**Academic Conduct:**

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" <https://policy.usc.edu/scampus-part-b/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

**Support Systems:**

*Student Counseling Services (SCS)* - (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. <https://engemannshc.usc.edu/counseling/>

*National Suicide Prevention Lifeline* - 1-800-273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

*Relationship & Sexual Violence Prevention Services (RSVP)* - (213) 740-4900 - 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

*Sexual Assault Resource Center*

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the

website: <http://sarc.usc.edu/>

*Office of Equity and Diversity (OED)/Title IX compliance – (213) 740-5086*

Works with faculty, staff, visitors, applicants, and students around issues of protected class. <https://equity.usc.edu/>

*Bias Assessment Response and Support*

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response.

<https://studentaffairs.usc.edu/bias-assessment-response-support/>

*Student Support & Advocacy – (213) 821-4710*

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. <https://studentaffairs.usc.edu/ssa/>

*Diversity at USC – <https://diversity.usc.edu/>*

Tab for Events, Programs and Training, Task Force (including representatives for each school), Chronology, Participate, Resources for Students.