

GENERAL ANNOUNCEMENTS & SYLLABUS
CHEMISTRY CHEM 4165 Inorganic Lab
UTEP, Fall 2015

Instructor: **Dr. Juan C. Noveron**

Class Location and time: CCSB 2.0502, Wednesday at 2:30 – 5:30 PM

Instructor's Office: CCSB 2.0420

Office Hours: M, 3- 5 PM, and by appointment

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1. Curriculum: Chemistry 4165 Inorganic Chemistry Lab will focus in laboratory practices of coordination chemistry as it relates to transition metal ions and their complexes, geopolymers, inorganic nanoparticle chemistry, inorganic photo-reactions, and coordination-directed self-organized materials. We will develop a sufficient theoretical and practical background that allows us to carry out experimental procedures from the inorganic chemistry research literature. Physical and analytical methods in inorganic chemistry will also covered in relation to characterization and critical evaluation of experimental results. Problem-based projects will be conducted in order to allow the creativity of the students an opportunity to create and discover new knowledge in the inorganic chemistry laboratory.

2. Recommended Textbooks:

The following textbook is recommended for this class, as well as the articles from the literature that will be provided by the instructor.

Advanced Inorganic Chemistry, Cotton, Wilkinson, Murillo, Bochmann. John Wiley & Sons, 1999

3. Grades: Letter grades will be assigned on the basis of your total score earned for the semester. This score is the sum of these assessments:

(a) *Attendance* (100 pts)

(b) *Lab Reports* (100 pts)

(c) *Oral Presentations*. (100 pts) Class presentations of 20 min. that discuss the experimental results in the context of literature.

(c) *Creative Activity*. (100 pts) Students will be guided towards producing a creative set of experiments, inspired by the literature, and allow them to develop new knowledge.

(d) Final Exam. (100 pts)

3. Laboratory Practices:

1. Experimental determination of the binding energy of Co(III)-Cl coordination bond in $[\text{Co}(\text{en})_2\text{Cl}_2]\text{Cl}$ the bond using the van Hoff equation.

2. Synthesis and characterization of gold-nanoparticles in TiO_2 photo-generation of reactive oxygen species.

3. Self-organized silicon-nanoparticles.

4. Electron paramagnetic resonance studies of gel-encapsulated Copper (II) coordination networks.

5. Homogeneous and heterogeneous catalysis using transition metal ion centers.

6. Synthetic analogues of the active site of metalloenzymes.

7. Metal-organic frameworks: Design, synthesis, and characterization.