



College of Arts & Sciences  
Inorganic Chemistry Laboratory - CHEM4390 Syllabus

**Instructor:** Dr. Yulun Han  
**Office:** STEM 311J  
**Office Hours:** M 10:00 am – noon  
**Email:** yulun.han@tamusa.edu

**Lab Hours:** MWF 9:00-9:50 am  
**Class Location:** STEM 173  
**Phone:** 210-784-2674

### Course Description

Inorganic chemistry is one of the four fundamental areas of chemistry. Students will delve into atomic and molecular structures, bonding theories, and symmetry principles. Topics include coordination chemistry, symmetry and group theory, molecular orbital theory, ligand field theory, and reactivity. Throughout the course, students will develop a deep understanding of how atomic-level interactions influence the properties and behaviors of inorganic compounds.

**Prerequisite:** MATH 1314 or equivalent. **Corequisite:** CHEM 4190 (Laboratory).

### Course Materials

Textbook: Inorganic Chemistry  
ISBN: 978-0198768128  
Authors: Mark T. Weller, Tina Overton, Jonathan Rourke, Fraser Armstrong  
Publisher: Oxford University Press, USA  
Publication Date: 2018-07-24  
Edition: 7th

### Learning Objectives

By the end of this course students will be able to:

- generate MO diagrams for simple polyatomic molecules and ions,
- use ligand field theory to interpret the electronic structures of coordination complexes,
- describe the mechanisms of simple inorganic reactions,
- demonstrate a foundational understanding of electronic structure and reactivity of inorganic complexes, focusing particularly on the transition metals.

**Communication:** The best way to contact instructors is via email. All correspondence between professors and students must occur via Texas A&M University San Antonio email accounts. Students are expected to access Blackboard regularly for updates on the course, announcements, and other course materials. All students are strongly encouraged to come to office hours or make appointments at other times to discuss course material and ask questions. Discussions concerning grading/grades will not be addressed through email and will only be discussed during office hours or scheduled appointments.

**Attendance Policy:** All students are expected to attend lectures and actively engage in class discussion, activities, and online assignments. If you are absent, you are responsible for the material covered and are expected to get notes, announcements and any other material from another student in the class.

**Conduct and Behavior:** My goal is to create a safe and engaging learning environment. Class disruptions are unacceptable, asking questions to clarify material during class does not qualify as a disruption and is encouraged. If you disrupt the class, you will be asked to leave for the day. Technology in the classroom may be a great resource but it can also hinder the learning process. Therefore, students are not allowed to wear ear buds and headphones and/or use cellphones during class. All cellphones must be on vibrate or turned off for the entirety of the class/lab period. In case of an emergency call, leave the room before answering the call. Texting during class is absolutely prohibited. The use of laptops, tablets or other devices for non-class related activities is not allowed. Electronic Devices during Exams. All electronic devices must be completely stored during exams and quizzes. Academic misconduct and attempts to cheat during the exam will be pursued according to Texas A&M-San Antonio code of conduct policy. You are discouraged from leaving the room during an exam. If you need to use the restroom, ask and leave all electronic devices with the instructor. Aggressive Behavior. The academic environment is meant for discussing ideas in a respectful manner. Tolerance, empathy, respect, and courtesy help us create a safe environment. Abusive and aggressive behavior will result in contacting the University Police Department and immediate removal of the student from the classroom. Visitors. Only students enrolled in the course are allowed in the classroom. No visitors are allowed. **IMPORTANT.** Each student receives this information during the first lecture. It is your responsibility to read this material and be familiar with the course content, procedures, and grading.

Tentative Schedule<sup>1</sup>

| Week | Date     | Topic  | Reading    | Comment |
|------|----------|--|------------|---------|
| 1    | 8/26/24  | Course introduction                                | Chapter 1  |         |
|      | 8/28/24  | Atomic structure                                   |            |         |
|      | 8/30/24  |  |            |         |
| 2    | 9/2/24   | Labor Day Holiday - No class                       |            |         |
|      | 9/4/24   | Molecular structure and bonding                    | Chapter 2  | QUIZ 1  |
|      | 9/6/24   |  |            |         |
| 3    | 9/9/24   | Molecular Symmetry and Group Theory                | Chapter 3  | QUIZ 2  |
|      | 9/11/24  |  |            |         |
|      | 9/13/24  |  |            |         |
| 4    | 9/16/24  | Molecular Symmetry and Group Theory                | Chapter 3  |         |
|      | 9/18/24  |  |            |         |
|      | 9/20/24  |  |            |         |
| 5    | 9/23/24  | Molecular Symmetry and Group Theory                | Chapter 3  |         |
|      | 9/25/24  |  |            |         |
|      | 9/27/24  |  |            |         |
| 6    | 9/30/24  | The structures of simple solids                    | Chapter 4  | QUIZ 3  |
|      | 10/2/24  |  |            |         |
|      | 10/4/24  |  |            |         |
| 7    | 10/7/24  | An introduction to coordination compounds          | Chapter 7  | QUIZ 4  |
|      | 10/9/24  |  |            |         |
|      | 10/11/24 |  |            |         |
| 8    | 10/14/24 | Electronic Structure of Transition Metal Complexes | Chapter 20 | QUIZ 5  |
|      | 10/16/24 |  |            |         |
|      | 10/18/24 |  |            |         |

<sup>1</sup> Instructor reserves the right to make changes as deemed necessary.

|    |          |   |                      |        |
|----|----------|---|----------------------|--------|
| 9  | 10/21/24 |   |                      |        |
|    | 10/23/24 |   |                      |        |
|    | 10/25/24 |   |                      |        |
| 10 | 10/28/24 | Reactions of Transition Metal Complexes | Chapter 21           | QUIZ 6 |
|    | 10/30/24 |   |                      |        |
|    | 11/1/24  |   |                      |        |
| 11 | 11/4/24  |   |                      |        |
|    | 11/6/24  |   |                      |        |
|    | 11/8/24  |   |                      |        |
| 12 | 11/11/24 | Organometallic chemistry                | Chapter 22           | QUIZ 7 |
|    | 11/13/24 |   |                      |        |
|    | 11/15/24 |   |                      |        |
| 13 | 11/18/24 |   |                      |        |
|    | 11/20/24 |   |                      |        |
|    | 11/22/24 |   |                      |        |
| 14 | 11/25/24 |   |                      | QUIZ 8 |
|    | 11/27/24 | Study day - No class                    |                      |        |
|    | 11/29/24 | Thanksgiving Holiday - No class         |                      |        |
| 15 | 12/2/24  | Presentations                           |                      |        |
|    | 12/4/24  |   |                      |        |
|    | 12/6/24  |   | Study day - No class |        |
| 16 | 12/9/24  | Final exam                              |                      |        |

**Grading:** Your final grade will be assigned based on your performance in four areas: (1) eight quizzes, (2) a final exam, (3) homework, and (4) a presentation.

|              |             |
|--------------|-------------|
| Quizzes (8)  | 500 points  |
| Final Exam   | 100 points  |
| Homework     | 200 points  |
| Presentation | 200 points  |
| Total Points | 1000 points |

$$\% \text{ of Total Points: } \left( \frac{\text{You total points}}{1000} \right) \times 100$$

|                |    |              |
|----------------|----|--------------|
| Letter Grades: | A: | 90.0 - 100%  |
|                | B: | 80.0 - 89.9% |
|                | C: | 70.0 - 79.9% |
|                | D: | 60.0 - 69.9% |
|                | F: | 0 - 59.9%    |

**Quizzes and Exams:** Occasional absences will be excused for the following reasons: illness (with a medical excuse), death of a close family member, religious holidays (please inform the instructor in advance), official university activities or class cancellations, military duties, pregnancy and related conditions, and participation in legal proceedings. Excessive absences (more than three) and tardiness will not be tolerated. Accumulating more than three unexcused absences may result in a grade of FA at the instructor's discretion. For excused absences, make-up tests will be allowed and must be taken in person when you return to campus. If you have a question about how your exam was graded or believe

there was an error in calculating your exam score, it is your responsibility to bring it to the instructor's attention within three calendar days of receiving your graded exam. No extra time will be allotted for exams; students must complete their work within the designated exam period.

**Homework:** Homework sets will be distributed approximately every week and will typically be due one week from when it is assigned. While each student must complete their homework individually, group discussions are encouraged.

**Presentation:** You will be REQUIRED to give a 15-minute presentation on a topic closely related to the lecture materials OR on a research article of any subject published in *Inorganic Chemistry Journal* by ACS Publications. If you choose a research article, it must have been published within the last ten years. For those presenting a research article, the presentation should include the following:

- Introduction to the paper, including the topic, journal, and authors.
- Explanation of why the paper was chosen.
- Presentation of the key findings and methods used in the research.
- Conclusion with a summary of the significant findings.

If you present a research article, you can earn up to 200 points of extra credit.

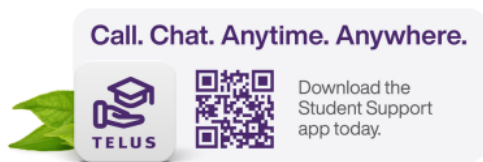
### **IMPORTANT POLICIES AND RESOURCES**

Academic Accommodations for Individuals with Disabilities: Texas A&M University-San Antonio is committed to providing all students with reasonable access to learning opportunities and accommodations in accordance with The Americans with Disabilities Act, as amended, and Section 504 of the Rehabilitation Act. If you experience barriers to your education due to a disability or think you may have a disability, Disability Support Services is located in the Central Academic Building, Suite 210. You can also contact us via phone at (210) 784-1335, visit us <https://www.tamusa.edu/Disability-Support-Services/index.html> or email us at [dss@tamusa.edu](mailto:dss@tamusa.edu). Disabilities may include, but are not limited to, attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability-related needs with Disability Support Services and their instructors as soon as possible.

Academic Learning Center: The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the *Tools* section of Blackboard. You can contact the Academic Learning Center by emailing [tutoring@tamusa.edu](mailto:tutoring@tamusa.edu), calling (210) 784-1307, or visiting the Central Academic Building, room 202.

Counseling/Mental Health Resources: As a college student, there may be times when personal stressors interfere with your academic performance and negatively impact your daily functioning. If you are experiencing emotional difficulties or mental health concerns, support is available to you through the Student Counseling Center (SCC). To schedule an appointment, call 210-784-1331 or visit Madla 120. All mental health services provided by the SCC are free and confidential (as the law allows). The Student Counseling Center provides brief individual and group therapy, crisis intervention, consultation, case management, and prevention services. For more information on SCC services visit [tamusa.edu/studentcounseling](http://tamusa.edu/studentcounseling)

*Crisis support is available 24/7 by calling the SCC at 210-784-1331 (after-hours select option '2').* Additionally, the TELUS Student Support App provides a variety of mental health resources to including support for in the moment distress, an anonymous peer to peer support network, mental health screenings, podcasts, and articles to improve your mental wellbeing.



Emergency Preparedness: JagE Alert is Texas A&M University-San Antonio's mass notification. In the event of an emergency, such as inclement weather, students, staff and faculty, who are registered, will have the option to receive a text message, email with instructions and updates. To register or update your information visit: <https://tamusa.bbcportal.com/>.

More information about Emergency Operations Plan and the Emergency Action Plan can be found here: <https://www.tamusa.edu/about-us/emergency-management/>.

Download the SafeZone App (<https://safezoneapp.com/>) for emergencies or call (210) 784-1911. Non-Emergency (210) 784-1900.

Financial Aid and Verification of Attendance: According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. Any student receiving federal financial aid who does not attend by the census date will have their financial aid terminated and returned to the DoE. Please note that any student who stops attending at any time during the semester, a Care report will be submitted, and you will possibly be dropped from the class. Your financial aid may have to be recalculated and a portion of your federal aid may have to be returned to the DoE.

Writing, Language, and Digital Composing Center: The Writing, Language, and Digital Composing Center supports graduate and undergraduate students in all three colleges as well as faculty and staff. Tutors work with students to develop reading skills, prepare oral presentations, and plan, draft, and revise their written assignments. Our language tutors support students enrolled in Spanish courses and students composing in Spanish for any assignment. Our digital studio tutors support students working on digital projects such as eportfolios, class presentations, or other digital multimedia projects. Students can schedule appointments through JagWire under the Student Services tab. Click on "Writing, Language, and Digital Composing Center" to make your appointment. The Center offers face-to-face, synchronous online, and asynchronous digital appointments. More information about what services we offer, how to make an appointment, and how to access your appointment can be found on our website at <https://www.tamusa.edu/academics/>.

Meeting Basic Needs: Any student who has difficulty affording groceries or accessing sufficient food to eat every day or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to submit a CARE referral (<https://www.tamusa.edu/university-policies/Student-Rights-and-Responsibilities/file-a-report.html>) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to direct you to available resources.

Military Affairs: Veterans and active-duty military personnel are welcomed and encouraged to visit the Office of Military Affairs for any question involving federal or state VA Education Benefits. Visit the

Patriots' Casa building, room 202, or to contact the Office of Military Affairs with any questions at [military.va@tamusa.edu](mailto:military.va@tamusa.edu) or (210)784-1397.

Religious Observances: Texas A&M University-San Antonio recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or course work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

The Six-Drop Rule: Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student's GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as "F" grades and will impact the student's GPA.

Statement of Harassment and Discrimination: Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equal opportunity, and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality and the uniqueness of the individual within our state, nation, and world. All decisions and actions involving students and employees should be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, gender identity, gender expression, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the appropriate offices within their respective units.

Texas A&M University-San Antonio faculty are committed to providing a safe learning environment for all students and for the university as a whole. If you have experienced any form of sex- or gender-based discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking, know that help and support are available. A&M-San Antonio's Title IX Coordinator can support those impacted by such conduct in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The university strongly encourages all students to report any such incidents to the Title IX Coordinator. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and trained victim advocates) are required to report information about such discrimination and harassment to the university. This means that if you tell a faculty member about a situation of sexual harassment, sexual violence, or other related misconduct, the faculty member must share that information with the university's Title IX Coordinator ([titleix@tamusa.edu](mailto:titleix@tamusa.edu), 210-784-2061, CAB 439K). If you wish to speak to a confidential employee who does not have this reporting requirement, you can contact the Student Counseling Center at (210) 784-1331 or visit them in Madla 120.

Pregnant/Parenting Students: Texas A&M-San Antonio does not require a pregnant or parenting student, solely because of that status or issues related to that status, to (1) take a leave of absence or withdraw from their degree or certificate program; (2) limit the student's studies; (3) participate in an alternative program; (4) change the student's major, degree, or certificate program; or (5) refrain from joining or cease participating in any course, activity, or program at the University. The university will provide such reasonable accommodations to pregnant students as would be provided to a student with

a temporary medical condition that are related to the health and safety of the student and the student's unborn child. These could include maintaining a safe distance from substances, areas, and activities known to be hazardous to pregnant individuals and their unborn child; excused absences because of illness or medical appointments; modified due dates for assignments; rescheduled tests/exams; taking a leave of absence; and being provided access to instructional materials and video recordings of lectures for excused absences, if these would be provided to any other student with an excused absence. Pregnant/parenting students are encouraged to contact the Title IX Coordinator with any questions or concerns related to their status ([titleix@tamusa.edu](mailto:titleix@tamusa.edu); 210-784-2061; CAB 439K). Texas A&M-San Antonio has also designated the Title IX Coordinator as the liaison officer for current or incoming students who are the parent or guardian of a child younger than 18 years of age. The Title IX Coordinator can provide students with information regarding support services and other resources.

Students' Rights and Responsibilities: The following statement of students' rights and responsibilities is intended to reflect the philosophical base upon which University Student Rules are built. This philosophy acknowledges the existence of both rights and responsibilities, which is inherent to an individual not only as a student at Texas A&M University-San Antonio but also as a citizen of this country.

#### *Students' Rights*

1. A student shall have the right to participate in a free exchange of ideas, and there shall be no University rule or administrative rule that in any way abridges the rights of freedom of speech, expression, petition and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the University, free from any form of discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, sexual orientation, gender identity, gender expression, and pregnancy/parenting or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of university student rules shall be assured a fundamentally fair process.

#### *Students' Responsibilities*

1. A student has the responsibility to respect the rights and property of others, including other students, the faculty, and administration.
2. A student has the responsibility to be fully acquainted with the published University Student Rules found in the Student Handbook, [Student Code of Conduct](#), on our website, and University Catalog, and to comply with them, as well as with federal, state, and local laws.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.
4. A student has the responsibility to recognize the University's obligation to provide a safe environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notifications.

We expect that students will behave in a manner that is dignified, respectful, and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation, or disability. Conduct that infringes on the rights of another individual will not be tolerated.

Students are expected to exhibit a high level of honesty and integrity in their pursuit of higher education. Students engaging in an act that violates the standards of academic integrity will find themselves facing academic and/or disciplinary sanctions. Academic misconduct is any act, or attempt, which gives an unfair advantage to the student. Additionally, any behavior specifically prohibited by a faculty member in

the course syllabus or class discussion may be considered as academic misconduct. For more information on academic misconduct policies and procedures please review the Student Code of Conduct (<https://www.tamusa.edu/university-policies/student-rights-and-responsibilities/documents/Student-Handbook-2022-23.pdf>) or visit the resources available in the OSRR website (<https://www.tamusa.edu/university-policies/student-rights-and-responsibilities/academic-integrity.html>).

### **Use of Generative AI Permitted Under Some Circumstances or With Explicit Permission**

There are situations and contexts within this course where you may be asked to use artificial intelligence (AI) tools to explore how they can be used. Outside of those circumstances, you should not use AI tools to generate content (text, video, audio, images) that will end up in any student work (assignments, activities, discussion responses, etc.) that is part of your evaluation in this course. Any student work submitted using AI tools should clearly indicate with attribution what work is the student's work and what part is generated by the AI. In such cases, no more than 25% of the student work should be generated by AI. If any part of this is confusing or uncertain, students should reach out to their instructor for clarification before submitting work for grading. Use of AI-generated content without the instructor's permission and/or proper attribution in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

NOTE: Guidance for how to cite AI-generators, like ChatGPT, can be found here <https://apastyle.apa.org/blog/how-to-cite-chatgpt>

### Important Dates:

|                |   |
|----------------|---|
| August 26      | First day of class  |
| September 2    | Labor Day Holiday   |
| November 11    | Last day to drop with an automatic "W"                    |
| November 19    | Last day to drop a course or withdraw from the University |
| November 27    | Study Day – No classes                                    |
| November 28-30 | Thanksgiving Holiday – No classes                         |
| December 5     | Last day of classes                                       |
| December 6     | Study Day – No classes                                    |
| December 7-13  | Final exams   |

*The complete academic calendar is available online: <https://www.tamusa.edu/academics/academic-calendar/index.html>*