Course Syllabus: Advanced Inorganic Chemistry

College of Science, Mathematics and Engineering
CHEM 4305, 4305A Section 201
Spring 2026 12-20 through 5-08

Contact Information

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Course Description

Advanced concepts in inorganic chemistry to include particle, atomic and molecular systems, Acid-Base chemistry, coordination and organometallic chemistry, group theory and applications in spectroscopy and synthesis

Textbook & Instructional Materials

Inorganic Chemistry, Shriver et.al. 6th edition
Publisher: Freeman plus supplemental material in-class

Study Hours and Tutoring Assistance

By arrangement with Instructor

Student Handbook

Refer to: Student Handbook

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given).
The student should be aware that both "taking" and "giving" improper assistance during examinations and Lab work constitutes academic dishonesty.

Students who are caught cheating on an examination or a quiz may receive an "F" for the *entire* course.

General Education Statement: Students in this course must demonstrate their competency in written communication, fundamental mathematical skills, and use of computers through exams, experimentation, and written reports**.** Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.

Office of Student Conduct

Grading

Table 1: Points and % allocated to each type of assignment

Graded Work	Points
Homework (5)	500
*Laboratory	300
3 Midterm Exams	300
Final Exam ACS preparation guide is recommended	
Final Exam ACS National Exam	200
Total Points	1300
*See laboratory schedule below	

Table 2: weighted % for final grade.

Grade	%
A	88.0-100.0
B	76.0-87.9
C	64.0-75.9
D	52.0-63.9
F	Less than 52.0

Table 3: Lecture and Homework schedule.

Chapters	Unit 1	Nucleosynthesis
1,2	Problem set 1	Structure, quantum M.
6	Problem set 2	Group theory
	Unit 2	**Exam 1**
7, 20	Problem set 3	A-B; Coord. I-III
21	Problem set 4	**Exam 2**
22	Problem set 5	Coord. IV
22		Organometallic **Exam 3**

Projects Required

None, unless Honors contract projects

Mid-Term Exam

Date announced one week prior to exam

Final Exam

Schedule is per Registrar's Office. *Confirm date and time* with final exam schedule on the Registrar's schedule of final exams website.

Extra Credit

None

Late Work

No additional points will be offered. No points will be dropped. Sufficient time for each assignment has been provided so that absences from illness or accident will not prevent completion (within reason).

Make Up Work/Tests

None. One missed exam score may be substituted with the final exam score with MSU approved reason.

Important Dates

Check dates on the Registrar's Academic Calendar.

Desire-to-Learn (D2L)

Extensive use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments, examination materials, and general course information. You can log into D2L through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Attendance

Students are expected to attend all meetings of the classes in which they are enrolled. Although in general students are graded on intellectual effort and performance rather than attendance, absences may lower the student's grade where class attendance and class participation are deemed essential by the faculty member. The instructor must give the student a verbal or written warning

prior to being dropped from the class. Instructor's records will stand as evidence of absences.

Students are expected to work all assigned problems and complete reading assignments. Students are expected to attend each lecture session. *Students will be held responsible for handouts, exercises, laboratory, lecture, and text materials for exam questions*. Once the lecture starts, students are expected to stay *until the professor dismisses the class*. In addition, students are expected to remain quiet except when addressing questions to the professor. Cell phones and pagers must be turned off. A student with excessive absences **(more than 3)** may be dropped from a course by the instructor. Any individual faculty member or college has the authority to establish an attendance policy, providing the policy is in accordance with the General University Policies.

Online Computer Requirements

Taking an online class requires you to have access to a computer (with Internet access) to complete and upload your assignments. It is your responsibility to have (or have access to) a working computer in this class. ***Assignments and tests are due by the due date, and personal computer technical difficulties will not be considered reason for the instructor to allow students extra time to submit assignments, tests, or discussion postings.*** Computers are available on campus in various areas of the buildings as well as the Academic Success Center. ***Your computer being down is not an excuse for missing a deadline!!** There are many places to access your class! Our online classes can be accessed from any computer in the world which is connected to the internet. Contact your instructor immediately upon having computer trouble If you have technical difficulties in the course, there is also a student helpdesk available to you. The college cannot work directly on student computers due to both liability and resource limitations however they are able to help you get connected to our online services. For help, log into D2L**.**

Instructor Class Policies

Attendance to lecture and lab-prep/laboratory is required. No hand-held electronic devices, connected laptops, connected tablets, Apple watches, ear buds or electronically configured eyeglasses are allowed in class except for non-graphing, non-programable scientific calculators. Lectures, lecture recordings and PowerPoint slides are copywritten and may not be transferred.

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. As described below, two formulas (federal and state) exists in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

Services for Students with Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Student Wellness Center, (940) 397-4140. Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to Disability Support Services.

College Policies

Campus Carry Rules/Policies

Refer to: Campus Carry Rules and Policies

Smoking/Tobacco Policy

College policy strictly prohibits the use of tobacco products in any building owned or operated by WATC. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy

To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place which prohibits the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Campus Carry

Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes has prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit Campus Carry.

Active Shooter

The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit MSUReady – Active Shooter. Students are encouraged to watch the video entitled "*Run. Hide. Fight.*" which may be electronically accessed via the University police department's webpage: *"Run. Hide. Fight."*

Grade Appeal Process

Students who wish to appeal a grade when unsatisfied with the Professor's response should consult the Midwestern State University MSU Catalog

*__Notice:__ Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor.

Laboratory Schedule:

Pre-Laboratory lecture will occur before each experiment. Laboratory materials will be distributed previous to the appropriate lecture. Additional laboratory periods may be utilized to learn instrumental technique and/or computational methodology as needed.

It is of paramount importance that the student prepares very well for the laboratory period. Most experimental work will require one or two periods of several hours each. Carefully planned procedures are required to successfully complete experiments. It is expected that this will be accomplished outside of laboratory. Failure to adequately prepare and/or complete experiments and analysis will result in damage to the experiment score.
Laboratory notebooks will be kept in the typical research laboratory style. Write-up of experimental results (including any data from instrumental studies and computational work) will be submitted for instructor evaluation and grading. These write ups will be brief, possibly 2-4 pages in length aside from graphs or other accumulated data. Computational experiments will require the addition of an electronic copy of the output files.* These can be e-mailed.

Under no circumstance will a cooperative effort be accepted for analysis and formal write up of data. Students may need to share data accumulated for an experimental product. If ANY indication of cooperation in the analysis and formal discussion of an experiment is noted, a zero for ALL PARTIES INVOLVED will be earned. A complete description of notebook and write-up methods will be provided.

Experiments:

1.* **Synthesis of metal acetylacetonate**. *Product will be utilized for other experiments*. **Preparation of Tris(2,4-pentanedionato)chromium(III)**

2.* **Absorption Spectra of Transition Metal Complexes**. A uv-vis and diffuse reflectance analysis of the d-d symmetry allowed transitions of complex metals. (UV-VIS spectrometer, IR spectrometer)

3.* **Spectroscopic Determination of** del-**o in Cr(III) complexes** (UV-VIS spectrometer)

4.* **Reaction of Cr(III)with the multidentate ligand EDTA**: a kinetics experiment. UV-VIS spectrometer- timed programming

5. **Molecular Modeling**: a semi-empirical analysis of the kinetic vs thermodynamic properties of an experimental product: *cis-trans* temperature dependence of a copper-glycine complex. This may require one lab period for instruction for utilizing **computational software**.

6. **Synthesis of Bio-Inorganic Complexes**: **A *cis-trans* isomerization study** of

a) cis-Bis(glycinato)copper(II) monohydrate and

b) *trans*-Bis(glycinato)copper(II)

computational software

* Wet-lab experiments requiring supervision and laboratory facilities