

# Inorganic Chemistry CHEM 301 Spring 2021

Monday & Wednesday

12:05 - 12:55 GILMAN 1352

Course website: [www.canvas.iastate.edu](http://www.canvas.iastate.edu)

**Instructor:** Dr. Julia Zaikina, Assistant Professor (Email: via Canvas)

**Office Hours:** Monday & Wednesday 1:10pm – 2:10 pm via Webex.

**T.A.:** Tori Cox (Email: via Canvas)

**TA Office Hours:** Friday, 2-3 pm via Webex.

## Course Learning Goals

This course will examine atomic and molecular structure, structure and chemical bonding principles, molecular shapes and symmetry, main group chemistry, acids and bases, and solid-state structures.

## Grading Policy

In-class Exams (3 total, 100 point each)	300 points
Homework (7 total, 10 points each)	70 points
Final exam (cumulative)	230 points

Tentative letter grade assignments (based on percentages) will be as follows: "A/A-," 90-100%; "B+/B/B-," 80-90%; "C+/C/C-," 70-80%; "D+/D/D-," 60-70%; "F", 0-60%. Important: final grades are based solely on graded work and are NOT negotiable; no single student will be offered make-up or extra credit points. Within these limits, I reserve the right to exercise discretion in deciding the exact cutoff.

## Textbook

- "Inorganic Chemistry" Shriver, Weller, Overton, Rourke, Armstrong, 6<sup>th</sup> edition, 2014 (ISBN-13: 978-1429299060; ISBN-10: 1429299061)
- "Introduction to Molecular Symmetry" J. S. Ogden, 1st Ed., Oxford, 2001 (ISBN 978-0198559108)

## Recommended:

- "Inorganic Chemistry" Solution Manual Alen Hadzovic, 6<sup>th</sup> Edition (ISBN: 0198701713)
- Molecular model kit (Play-Doh + tooth sticks)
- Miessler & Tarr, Inorganic Chemistry, 5th Ed., Pearson, 2014 (ISBN 01321811054)
- "Essential Trends in Inorganic Chemistry" D. M. P. Mingos, 1<sup>st</sup> Edition (ISBN-13: 978-0198501084; ISBN-10: 0198501080)
- N.N. Greenwood, A. Earnshaw: Chemistry of the Elements, 2nd Edition, Butterworth-Heinemann, Oxford, 1997 (ISBN: 0750633654).
- C. E. Housecroft, A. G. Sharpe, Inorganic Chemistry, Prentice Hall, 3rd edition, December 2007, (ISBN 0131755536).

**Weblinks:**

Symmetry: <https://symotter.org/>  
Packing and Solids: <http://crystals.otterbein.edu/packing/index.html>  
Periodic Table: <http://www.webelements.com/>  
Orbitals: <http://winter.group.shef.ac.uk/orbitron/AOs/6s/e-density.html>  
Good Resource: <https://www.chemtube3d.com/category/structure-and-bonding/>

**Lectures:** You are expected to **attend regularly** and to read the available material (textbook and lecture notes) before lecture. Not everything covered in lectures is present in the book and/or lecture notes. Lecture video recordings will be posted on Canvas.

**Homework:** Each homework assignment will be due at the specific day (Monday, see Table below) and should be uploaded on Canvas or turned in in-person before the start of the lecture. If homework has been turned in by both methods, only the work turned in in-person will be graded. No late assignments will be accepted without some approved advanced notice. **In your answers, write legibly.** Feel free to work with other students on the homework, but you must turn in your own individual set of solutions. All work must be shown to receive full credit. Each homework assignment will be worth a total of 10 points. **Randomly selected subset of problems from each homework assignment will be graded.** Solutions to the homework will be posted on Canvas after the due date.

**Top Hat:** We will be using the Top Hat ([www.tophat.com](http://www.tophat.com)) classroom response system in class. You will be able to submit answers to in-class questions using smartphones, tablets, laptops, or through text messaging. Your answers to the Top Hat questions during lectures will be used as a basis to add bonus points to your score in the case your score is near grade cut-off. Make sure to monitor your performance on the Top Hat app.

You can visit the Top Hat Overview page (<https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide>) within the Top Hat Success Center which outlines how you can register for a Top Hat account; this page also provides a brief overview about getting you up and running with the system. You will be required to purchase a Top Hat license from the ISU Book Store or online in order to access any quizzes or questions your instructor creates in the Top Hat system. To register, you must use your ISU email address.

An email invitation has been sent to you by email, but if don't receive this email, you can register by simply visiting our course website: <https://app.tophat.com/e/521936/>

Our Course Join Code is **521936**

Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491.

Bring your device to all lectures. Sharing the attendance code with classmates who are absent from class, having a classmate give you the attendance code while you are absent from class, submitting answers while absent from class, sharing answers with students who are not in class, etc. constitute *academic misconduct*.

### In-class Exams (3 in total)

Three 50-min exams (100 points each) will be given during the assigned class times. Make sure you understand and can work out all the assigned problems from homeworks, relevant examples in the text, and any problems that are presented in class.

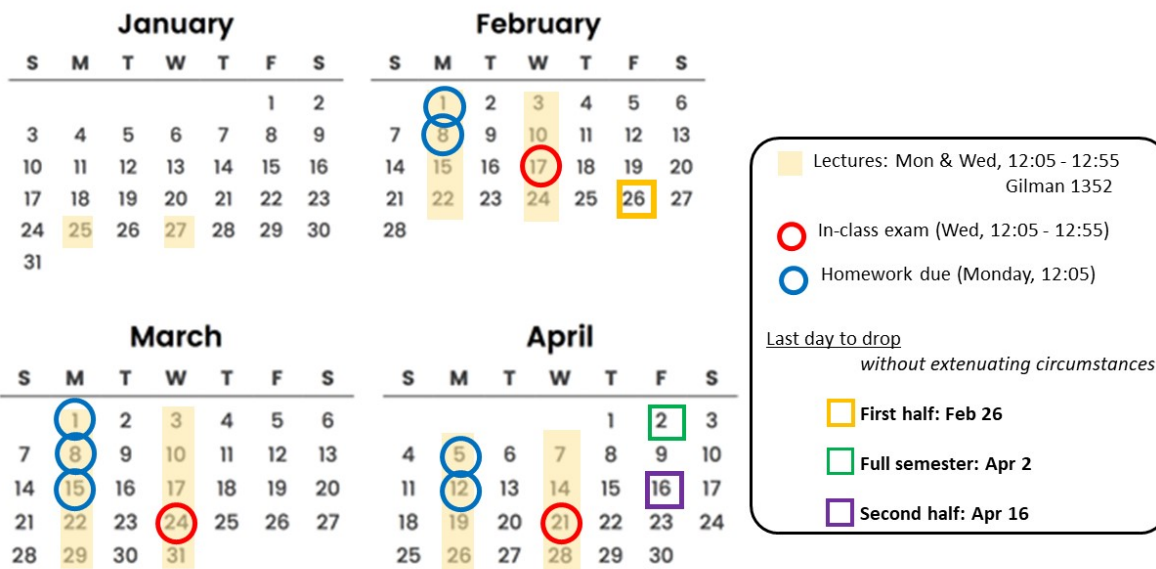
- Exams will be given in-class on February 17, March 24, and April 21
- List of concepts for each exam will be announced in class and uploaded to Canvas
- Each exam includes a mix of short answer questions and problem solving, including writing brief explanations.
- Each exam should be written *neatly*, with the answers to the questions in order.

### Final Exam (Wednesday, May 5<sup>th</sup>, 2:15 – 4:15 pm, Location: TBA)

A 2-hour comprehensive final exam (230 points).

### (Tentative) Examination Schedule and Reading Assignments

Date(s)	Topic	Reading	Homework Due
Jan. 25, 27	Introduction, Atomic Structure	Ch 1,	
Feb. 1, 3	Atomic Structure, Periodic Trends	Ch 9	HW1 - Feb. 1
Feb. 8, 10, 15	Simple Bonding Theories & Diatomic Molecules	Ch 2	HW2 - Feb. 8
<b>Feb. 17</b>	<b>EXAM 1 (Atomic Structure, Simple Bonding Theories)</b>		
Feb. 22, 24, Mar. 1, 3, 8	Symmetry	Ch 6	HW 3 – Mar. 1 HW 4 – Mar. 8
Mar. 10, 15, 17, 22	Molecular Orbitals	Ch 2, Ch.6	HW 5 – Mar. 15
<b>Mar. 24</b>	<b>EXAM 2 (Symmetry, Molecular Orbitals)</b>		
Mar. 29, 31	Trends in the Main Group	Ch 4	HW 6 – Apr. 5
Apr.5, 7, 12, 14, 19	Elements, Acids-Bases	Ch 10-17	HW 7 – Apr. 12
<b>Apr. 21</b>	<b>EXAM 3 (Molecular Orbitals, Main Group)</b>		
Apr. 26, 28	Solid-State	Ch 3	
May 5	<b>FINAL EXAM</b>		



**Final examinations: Wednesday, May 5, 2:15 – 4:15 pm**

### COVID-19 health and safety requirements

Students are responsible for abiding by the university's [COVID-19 health and safety expectations](#). All students attending this class in-person are required to follow university [policy](#) regarding health, safety, and face coverings:

- wear a cloth face covering in all university classrooms, laboratories, studios, and other in-person instructional settings and learning spaces. Cloth face coverings are additionally required to be worn indoors in all university buildings, and outdoors when other people are or may be present where physical distancing of at least 6 feet from others is not possible. Students with a documented health or medical condition that prevents them from wearing a cloth face covering should consult with [Student Accessibility Services](#) in the Dean of Students Office.
- ensure that the cloth face covering completely covers the nose and mouth and fits snugly against the side of the face.
- practice physical distancing to the extent possible.
- assist in maintaining a clean and sanitary environment.
- not attend class if you are sick or experiencing symptoms of COVID-19.
- not attend class if you have been told to self-isolate or quarantine by a health official.
- follow the instructor's guidance with respect to these requirements. Failure to comply constitutes disruptive classroom conduct. Faculty and teaching assistants have the authority to deny a non-compliant student entry into a classroom, laboratory, studio, conference room, office, or other learning space.

These requirements extend outside of scheduled class time, including coursework in laboratories, studios, and other learning spaces, and to field trips. These requirements may be revised by the university at any time during the semester.

In accordance with university policy, instructors may use a face shield while they are teaching as long as they are able to maintain 8 feet of physical distance between themselves and students during the entire instructional period. Some form of face covering must be worn at all times in learning spaces regardless of the amount of physical distancing.

Faculty may refer matters of non-compliance to the Dean of Students Office for disciplinary action, which can include restrictions on access to, or use of, university facilities; removal from university housing; required transition to remote-only instruction; involuntary disenrollment from one or more in-person courses; and other such measures as necessary to promote the health and safety of campus.

It is important for students to recognize their responsibility in promoting the health and safety of the Iowa State University community, through actions both on- and off-campus. The university's faculty asks that you personally demonstrate a commitment to our Cyclones Care campaign. Iowa State University's faculty support the Cyclones Care campaign and ask you personally to demonstrate a commitment to our campaign. Your dedication and contribution to the campaign will also protect your family, classmates, and friends, as well as their friends and families. Our best opportunity for a successful fall semester with in-person learning and extramural activities requires all of us to collaborate and fully participate in the Cyclones Care campaign.

### **Attendance Policy**

All students are expected to attend lecture, be prepared and fully participate in the in-class activities. Absences due to documented illness, deaths in the immediate family and other documented crises, call to active military duty or jury duty, religious holidays, and official University activities will be accommodated by the instructor. Consideration will also be given to students whose dependent children experience serious illness. All students are expected to abide by this class attendance policy. Regardless of whether an absence is excused or unexcused, the student is responsible for making up all work that is missed and following the announcements made in missed class.

In the event of missing classes when ill whether due to COVID-19 or not – you are strongly encouraged to stay at home. Additional absences may occur due to your self-isolation in the cases of positive testing of a person you have been in contact. All those cases are legit absences and will be accommodated with possibilities for making up quizzes and exams. Those will be dealt with on a case-by-case basis.

FAQ Resource: <https://web.iastate.edu/safety/updates/covid19/faqs>

### **Academic Dishonesty**

The class will follow Iowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the [Dean of Students Office](#).

### **Accessibility Statement**

Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be

identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at [www.sas.dso.iastate.edu](http://www.sas.dso.iastate.edu), by contacting SAS staff by email at [accessibility@iastate.edu](mailto:accessibility@iastate.edu), or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1076 Student Services Building.

### **Discrimination and Harassment**

Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. Veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, 3410 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, Tel. 515-294-7612, Hotline 515-294-1222, email: [eooffice@iastate.edu](mailto:eooffice@iastate.edu)

### **Religious Accommodation**

Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. In all cases, you must put your request in writing. The instructor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course. For students, you should first discuss the conflict and your requested accommodation with your professor at the earliest possible time. You or your instructor may also seek assistance from the [Dean of Students Office](#) at 515-294-1020 or the [Office of Equal Opportunity](#) at 515-294-7612.

### **Academic misconduct:**

Academic Misconduct in any form is in violation of Iowa State University Student Disciplinary Regulations and will not be tolerated. This includes, but is not limited to: copying or sharing answers on tests or assignments, plagiarism, and having someone else do your academic work. The class will follow Iowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the [Dean of Students Office](#).

### **Free Expression**

Iowa State University supports and upholds the First Amendment protection of freedom of speech and the principle of academic freedom in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.