

## Welcome to using the rest of the Periodic Table!

Welcome to N331! I seriously cannot begin to express how much I am looking forward to starting this semester face-to-face! Thanks to the feedback and student suggestions over the past year, I am excited to implement some of the lessons learned from our COVID experience to make our time even more engaging! Together, we are a community of learners—that means you will \*hopefully\* be learning from me, but also that I will be learning from each of you along the way! I promise I will do my best to help each of you succeed in this course to the level you are willing to work. Take some time to think about what success in this class means to you—building problem solving and critical thinking skills you can take past this semester, a specific course grade, or even a personal best on a chemistry exam? You all belong here, but each have goals that are unique as you are! My job is to provide the resources *you* need to meet *your* goals!

Cheers,  
Prof. Porter

## Teaching Team Contact Information and Review Sessions

**Instructor** Prof. Meghan Porter  
Chemistry A269  
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**Teaching Team:** Check back soon on our Canvas page!

**Weekly Review Sessions:** Each week, we offer multiple hour-long review sessions to help answer questions or even simply discuss concepts for in-depth understanding—really anything that comes to your mind! **A list of all sessions can be found on our Canvas home page.** Review sessions will be offered as a mix of in-person and Zoom options. Zoom sessions are accessed via our Zoom channel (meeting ID: 915 3120 7223; password 803107) or via this link:  
<https://iu.zoom.us/j/91531207223?pwd=UzVNBGZyd0Zjb1orZDE3R1c1cWIEUT09>.

## Learning Objectives

At the end of the course, students will demonstrate the ability to:

- Summarize the fundamental atomic structure and its relationship to periodic properties
- Visualize chemical systems using three-dimensional representations
- Explain chemical bonding using molecular orbital and crystal/ligand field theories
- Analyze the spontaneity of a chemical reaction
- Examine how metal oxidation state, complex geometry, and ligand identity influence chemical behavior
- Solve multi-part problems requiring application of inorganic, organic, and general chemistry concepts
- Understand how course topics relate to current research

## Expectations for Our Classroom Environment

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### **Community Expectations**

One thing to always keep in mind when taking any course is that everyone you interact throughout the semester - including your teaching team - are human beings and deserve to be treated as such *in-person and online*. The feeling of anonymity that some people have when they are online can lead behaviors that are not acceptable here. All community members deserve to feel safe and respected *at all times*. Even in scientific conversation, personal opinions may play a role in class dialogues. Please remember that understanding the material does not mean you have to embrace all viewpoints represented. All students are welcomed and encouraged to actively participate in the learning of chemistry, regardless of race, gender, social class, religious beliefs, previous academic experience, etc... Students deserve to be addressed using the names and pronouns that they prefer and have explicitly stated. If you have a preferred name that differs from the name that appears on our class roster, please consider adding your preferred name in Canvas by visiting [one.iu.edu/task/iu/change-my-name](https://one.iu.edu/task/iu/change-my-name). As part of the IU community, we wish to acknowledge and honor the Miami, Delaware, Potawatomi, and Shawnee people, on whose ancestral homelands and resources Indiana University was built.

The goals of this course can only be accomplished in a setting of mutual respect. During our first meeting, we will work together to create a community contract that lays out our expectations for one another.

### **Content Expectations**

This class relies on your knowledge of the foundations learned in both general and organic chemistry. If you do not remember something from a previous course, make note of it and look it up or ask for help; *do not simply let it go*. I am happy to review material as needed (and if asked) during weekly review sessions, but if you don't ask, I cannot guess you are struggling. There is no way to cover the necessary new material while continuing to review old coursework during lecture and practice sessions.

### **Technology Expectations**

Although this course will be held face-to-face, course resources and information will be provided via Canvas. Additionally, all quizzes and retake opportunities will be administered using Canvas. Thus, you will need a computer with reliable internet access, a microphone, and a working webcam. **You must use your zoom.iu.edu account** to access online review sessions as only iu authenticated users will have access. Zoom virtual backgrounds are allowed as long as they are not distracting and do not violate our community expectations for a safe and respectful environment. If you have unmet technology needs, please discuss with me at your earliest convenience. If you are worried about a reliable internet connection, the academic buildings have computer labs open for use.

If you have never used Zoom through your IU account before, please go through the following knowledgebase document: <https://kb.iu.edu/d/bfqu>. For technology related help, please contact IT support (see Canvas homepage). **Please do not contact the instructor or AIs with technology questions**. They are not qualified to answer these questions.

### **Communication Expectations**

This term we will be using InScribe (Q&A community) for all class discussion and Q&A. This system is designed to get you the help and/or answers you seek as fast and efficiently and possible from classmates, the AIs, and myself. Rather than emailing questions to the teaching team, you will be expected to post your questions to this community first. The teaching team will wait for your classmates to offer their suggestions before answering.

## How We Will Learn in this Course

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Although this is a large course, the teaching team has done our best to structure it in a way that will allow each of you to get the content, practice, and support you need to achieve your goals for N331. Each week, you will attend a discussion session where you will work in small groups on activities designed to strengthen your skills and increase your comfort with the material. During class time, we will use a combination of lecture, short group work sessions, and flipped classroom sessions. The flipped classroom sessions will be used to highlight material, as well as challenge you to push your understanding while having the support of the teaching team readily available.

Each topic will have practice problems provided for your benefit, but they will not be collected nor graded. At this point in your college career, you are expected to work through problems, seek help when needed, and determine for yourself what you do and do not know.

The course information is divided into Modules. As there is a lot of information provided on Canvas, we suggest minimizing modules and accessing everything through the weekly information module. The modules are as follows:

1. Weekly Information

Each week will have a to-do list provided for that week and links to any lecture notes, practice problems, resources, and assignments. **All information needed for each week can be accessed via the links in these pages.**

2. Topic Resources

Each topic will have a dedicated page including lecture notes and practice problem, keys, resources, and associated topic quiz

3. Quizzes

This module contains all topic quizzes and retake opportunities, along with previous cumulative challenges for you to practice

4. Fundamentals

This module has review pages for each of the fundamental quiz content and access to the fundamental quizzes.

5. Additional Assessments

This module includes all additional assessments, including pre-/post-tests, You-Teach assignments, etc...

6. Extra Credit Opportunities

## Required Course Materials

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- Access to JoVE Science Education Video Library (automatically provided through Canvas)
- Calculator (non-graphing for Cumulative Challenges)
- Access to technology tools
  - Canvas, Zoom (webcam and microphone), Kaltura, and Google at IU
  - Ability to **scan** or **take pictures** of your work, then **upload** that file as a single pdf. There are free scanning apps (genius scan, cam scanner, adobe, etc...) that will generate multi-page pdfs. It is recommended you download one of these apps that turn the picture into a pdf on your phone, rather than emailing the photo to your computer and then turning it into a pdf.
  - Quizzes will be administered with Respondus Lockdown Browser. System requirements are shown below.
    - Windows: 10, 8, 7
    - Mac: MacOS 10.12 or higher
    - iOS: 11.0+ (iPad only)

- Boost
  - Students are **strongly recommended** to use Boost, a free smartphone app developed at IU that provides reminders about schoolwork in Canvas. It helps keep track of assignment deadlines, important announcements, and course events. For more information, see <https://kb.iu.edu/d/atud> or <https://boost.iu.edu>

## Course Assessments

### Fundamental Assessments

The pre-requisites courses required for N331 are selected due to the content covered in them being essential for success. We must be able to depend on students being able to use that information. Although we understand that students often take semesters off from chemistry between courses, this does not change the fact that the pre-requisite content is *your* responsibility. However, we want to help you assess your current understanding of these fundamental aspects through five fundamental assessments. All the assessments will be available at the start of the semester and can be taken on your own time, but each must be completed by the stated due date. You will have three chances to complete each quiz and must score a 90% on a quiz to count as “complete”.

Number of “Complete” Fundamental Quizzes	Points Toward Total Course Points
5	30
4	25
3	20
2	15
1	10
0	0

### Topic Quizzes

Roughly once per topic you will have an open note (**not** open internet/classmate) quiz on the foundation of that topic. There will be a total of 10 quizzes and your top 9 scores will be kept. We will be using Respondus Lockdown Browser for all quizzes. Quizzes will be on Canvas and consist of randomized multiple choice, long answer, and file upload question types. After the completing the quiz, you will have the opportunity to retake the quiz to improve your score. We cannot accommodate individual schedules of ~200 students; **if you miss a quiz, even for an excused reason, and do not take the retake your final score that quiz will entered as a ‘0’.** There will be no make-up quizzes outside of the scheduled quiz and retake opportunities. Instances of cheating may result in narrower time windows, locking questions after each answer, and only being able to see one question at a time **for all students**.

- If you complete the initial quiz and choose not to take the retake, you will receive the score from your initial quiz
- If you complete the initial quiz and the retake, scoring *higher* on the retake, your final score will be the average of your two scores
- If you complete the initial quiz and the retake, scoring *lower* on the retake, your final score will simply be your initial quiz score
- If you do not to take the initial quiz and complete the retake, you will receive the score from your retake. However, *you will not have access to the initial quiz questions or quiz feedback.*

### Cumulative Challenges

Throughout the semester, there will be three cumulative challenges, with a final cumulative challenge during finals week. The questions will require you to synthesize your knowledge from all topics we have discussed prior to that point. There are no dropped cumulative challenges. There are no make-up challenges- if you miss an in-semester cumulative challenge, the grade will be replaced with your score on the final challenge. You must take the final challenge to

complete the course. If your score on the final challenge is higher than your lowest in-semester challenge, we will automatically replace that challenge score with the one from your final challenge.

### ***In-Video Questions for Flipped Classroom Sessions***

There will be three topics (Molecular Orbital Theory, Crystal/Ligand Field Theory, Organometallics) that will require you to watch a series of videos in preparation for flipped classroom sessions. These will have embedded questions you will need to answer while watching. You will have two attempts to complete these questions and your highest score from each set will be recorded. Your Flipped Classroom Preparation score is determined by the percentage of in-video questions you answer correctly.

Percent In-Video Questions Correct	Points Toward Total Course Points
90	12
80	10
70	8
60	6
50	4
40	0

### ***“You Teach” Activities and Peer Review***

This semester, you will create two activities designed to assist future N331 students in learning the concepts. For each activity, students will randomly be assigned an activity to work through and provide feedback on. Activity details will be posted on Canvas at a later date.

### ***Pre-/Post Test***

You will be asked to complete a pre- and post-test for this course. The pre-test will be used to gauge class understanding of N331 topics (don't worry, none is expected for the pre-test 😊). The post-test will be used as an assessment tool by allowing us to measure the learning goals accomplished throughout the semester. These tests are scored based solely on completion; however, you are expected to give your best effort. Simply clicking through the answers to finish the quiz as quickly as possible will result in a score of zero.

### ***Problem-Solving Sessions***

We expect students to attend their discussion section each week and to attend all flipped classroom sessions throughout the semester (as noted in the syllabus). While attendance at these sessions is required, and a make-up activity will be provided for excused absences only, we understand that life sometimes gets in the way. Thus, you can miss two sessions without impacting your grade.

Number of Absences	Points Toward Total Course Points
1	26
2	21
3	16
4	11
5	6
> 5	0

### ***Taking it Farther Opportunities***

Throughout the semester, you have the option to complete tasks designed to help your learning of the material or demonstrate your understanding of the content covered this semester. These are not graded solely on completion, but on quality of the finished product. Taking it farther points will be added on to your final semester point total (not to exceed 600 total course points). Details of these opportunities can be found on Canvas.

### **Assessment Breakdown**

Approximately 40% of your grade is determined from your mastery of course fundamentals, 35% by your ability to apply knowledge to novel situations, 15% from alternative assessment styles, and 10% by your willingness to engage in the course.

**Mastery of Course Fundamentals**

Fundamental assessments (5 total)	30 pts	5%
Topic quizzes (10 x 22 pts; drop lowest)	198 pts	33%
In-video questions for flipped classroom	12 pts	2%

**Application of Knowledge**

In-semester cumulative challenges (3 x 50 pts)	150 pts	25%
Final cumulative challenge	60 pts	10%

**Alternative Assessment Styles**

You-Teach! Assessments (2 x 38 pts)	76 pts	13%
Peer-review (2 x 8 pts)	16 pts	3%

**Willingness to Engage in the Course**

Pre-/Post-test (2 x 6 pts; completion)	12 pts	2%
Survey completion (4 x 5 pts; completion)	20 pts	3%
Discussion and flipped classroom participation (by absences)	26 pts	4%

<b>Total</b>	<b>600 pts</b>	<b>100%</b>
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**Regrade Policy**

Not looking at your scores/feedback is not an excuse for a delay in asking for a regrade. If you do not submit your request in specified length of time, you forfeit the right for a regrade *whether you are right or wrong*. Remember, we grade based on what is written on the page, not the intended meaning behind it. The entire assignment will be subjected to re-evaluation strictly based on the key when it is submitted for a grade correction. This means you may gain points on questions you should have received additional credit for and lose points on questions where the grader was nice and gave you the benefit of the doubt with points for an answer that was not strictly correct.

**Quizzes:** Regrade requests for quizzes must be made within 72 h after grades have been released and keys made available for the retake opportunity. This means that, even if you request a regrade on the original quiz, you may wait until after the keys are made available from the regrade to make your request.

**Challenges:** Regrade requests for challenges must be made within 72 h after grades have been released and keys made available.

**Integrity**

**Students and faculty are responsible for maintaining the academic integrity of the University.** You are advised to read the *Code of Student Rights, Responsibilities and Conduct*. Essentially, it is the instructor's decision, based on evidence and student interviews, whether misconduct has occurred. The sanctions made against a student committing academic misconduct may range anywhere from deduction of points to awarding a failing grade for the entire class. ALL cases of academic misconduct will be immediately reported to the Dean of Students as well as the dean or director of the student's school. Instances of cheating on quizzes may result in narrower time windows, locking questions after each answer, and only being able to see one question at a time **for all students**.

Specific violations may include (this is *not* an exhaustive list):

- The intentional use of any unauthorized study aids and/or equipment. This includes Chegg, Course Hero, or any other online resources where the answer is generated for the student and using additional pages other than those allowed.

- Copying another individual's work. This includes current or former N331 students, Chegg, Course Hero, Bartelby or any other online resources where the answer is generated for the student.
- Allowing/aiding another individual to cheat from you.
- Acquiring help during an assessment event where you obtain points for your work, such as a graded worksheet, quiz, or challenge.
- Resubmitting an assignment for a re-grade after changing an answer.
- Falsifying documentation to show illness, funeral proceedings, etc... in order to miss or hand in late a graded assignment.

These and similar actions are considered forms of cheating and will be dealt with according to the Code of Academic Ethics described in the Schedule of Classes.

**Course Materials:** The instructor teaching this course holds the exclusive right to distribute, modify, post, and reproduce course materials, including all written materials, study guides, lectures, assignments, exercises, and challenges. Some of the course content may be downloadable for students who may only have intermittent access to the internet; but you should not distribute, post, or alter the instructor's intellectual property. While you are permitted to take notes on any online materials and lectures posted for this course for your personal use, you are not permitted to re-post in another forum, distribute, or reproduce content from this course without the express written permission of the faculty member.

**Note Selling:** Several commercial services have approached students regarding selling class notes/study guides to their classmates. Selling the instructor's notes/study guides or uploading course assignments to these sites in exchange for access to materials for other courses is not permitted. Violations of this policy will be reported to the Dean of Students as academic misconduct (violation of course rules).

**Violations of these policies will be reported to the Dean of Students as academic misconduct (violation of course rules).** Sanctions for academic misconduct may include a failing grade on the assignment for which the notes/study guides or assignments are uploaded, a reduction in your final course grade, or a failing grade in the course, among other possibilities. Additionally, you should know that selling a faculty member's notes/study guides individually or on behalf of one of these services using IU email or via Canvas may also constitute a violation of IU information technology and IU intellectual property policies; additional consequences may result.

## **Campus Resources (See "Where to Turn" on Canvas for Additional Resources)**

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### **Equity and Access for Students with Disabilities**

The University strives to make all learning experiences as accessible as possible. The Office of Disability Services for Students (DSS) is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations. If you have, or think you may have, a disability, please contact DSS to arrange a confidential discussion regarding equitable access and reasonable accommodations. Accommodations are your legal right! If you are already registered with DSS and have a current accommodations letter, please contact me as soon as possible. I also invite you to discuss your learning needs with me, regardless of your status with DSS.

(812) 855-7578 / iubdss@indiana.edu

<https://studentaffairs.indiana.edu/disability-services-students>

### **Bias-Based Incident Reporting**

Students, faculty, and staff can make bias-based incident reports. Any act of discrimination or harassment based on race, ethnicity, religious affiliation, gender, gender identity, sexual orientation, or disability can be reported through any

of these options: 1) email [biasincident@indiana.edu](mailto:biasincident@indiana.edu) or [incident@indiana.edu](mailto:incident@indiana.edu); 2) call the Dean of Students Office at (812) 855-8188 or 3) use the IU mobile app ([m.iu.edu](http://m.iu.edu)). Reports can be made anonymously.

### **Mandatory Reporting**

As your instructor, one of my responsibilities is to create a positive learning environment for all students. Title IX and IU's Sexual Misconduct Policy prohibit sexual misconduct in any form, including sexual harassment, sexual assault, stalking, and dating and domestic violence. If you have experienced sexual misconduct, or know someone who has, the University can help. If you are seeking help and would like to speak confidentially, you can make an appointment with:

The Sexual Assault Crisis Service (SACS): 812-855-8900 (counseling services)

Confidential Victim Advocates (CVA): 812-856-2469 (advocacy and advice services)

IU Health Center: 812-855-4011 (health and medical services)

It is also important that you know that Title IX and University policy requires *any member of our teaching team* to share any information brought to our attention about potential sexual misconduct with the campus Deputy Title IX Coordinator or IU's Title IX Coordinator. In that event, those individuals will work to ensure that appropriate measures are taken and resources made available. Protecting students' privacy is of utmost concern, and information will only be shared with those that need to know to ensure the University can respond and assist. I encourage you to visit <http://stopsexualviolence.iu.edu/help/index.html> to learn more.

### **Counseling Services and Emotional Wellbeing**

If you find that life stressors are interfering with your academic or personal success, you are encouraged to contact [CAPS](#) as early in the semester as possible. CAPS services can help with issues that range from coping with life's transitions to dealing with more serious emotional problems. All fulltime students are eligible for personal and confidential short-term counseling services and receive two-free CAPS sessions each semester. [Group counseling](#) is available for issues such as anxiety and dissertation support.

CAPS is located in the IU Student Health Center, at 600 N. Jordan Avenue. The Student Health Center is generally open from 8:00 am–12:00 pm and 1:00 pm–4:30 pm (Monday – Friday), but can vary slightly each semester. The best way to request services is by calling 812-855-5711. After hours, the crisis line is available to students 24/7 by calling 812-855-5711 (option 1). For more information, visit the CAPS website: <https://healthcenter.indiana.edu/counseling/index.html>

### **Food Security**

If at any point during the semester you find yourself struggling with access to food, the [Crimson Cupboard](#) offers free food to any IU Bloomington student who cannot otherwise afford it. The Crimson Cupboard operates on the honor system and will never ask for financial information. You can visit the pantry once per week. The Crimson Cupboard is located in Campus View Apartments at 800 N Union Street. You can contact the pantry at 812-855-1924 or via email at [cupboard@indiana.edu](mailto:cupboard@indiana.edu). The hours vary throughout the semester, so please visit their website for the most up-to-date hours: <https://studentaffairs.indiana.edu/student-support/crimson-cupboard/index.html>

**Tentative Course Schedule**

Please keep in mind that the instructor reserves the right to adjust course schedule if presented with extenuating circumstances. These changes will be decided by mutual agreement with the class and/or to improve student learning.

Topics written in **bold** indicate flipped classroom weeks for attendance purposes. All quizzes will be given through Canvas and will be available on Thursdays. All "Fundamental" quizzes will be available at the start of the semester.

<b>Week</b>	<b>Lecture Content</b>	<b>Assessments Due</b>
<b>Pre-Course</b>	Getting Started in N331	Help Us Know YOU! Survey Course Policies (Fundamental 1)
<b>1 (8/23-8/28)</b>	Topic 1: Atomic and Molecular Structure	Fundamental 2 Pre-test
<b>2 (8/29-9/4)</b>	<b>Topic 2: Bonding Theory</b>	Motivation Survey Fundamental 3 Quiz: Atomic and Molecular Structure
<b>3 (9/5-9/11)</b>	<i>No class on Monday: Labor Day</i> <b>Topic 2: Bonding Theory</b> Topic 3: Redox Chemistry	Fundamental 4 Quiz: Molecular Orbital Theory Retake: Atomic and Molecular Structure
<b>4 (9/12-9/18)</b>	Topic 3: Redox Chemistry	Quiz: Redox Chemistry Retake: Molecular Orbital Theory
<b>5 (9/19-9/25)</b>	Topic 3: Redox Chemistry: Latimer/Frost Topic 4: Structure and Bonding	<b>Cumulative Challenge 1 (Topics 1–3)</b> Retake: Redox Chemistry
<b>6 (9/26-10/2)</b>	Topic 4: Structure and Bonding <b>Topic 5: Crystal/Ligand Field Theory</b>	Fundamental 5 Quiz: Redox Chemistry: Latimer/Frost You Teach! Activity 1
<b>7 (10/3-10/9)</b>	<b>Topic 5: Crystal/Ligand Field Theory</b> <i>No class on Friday: Fall Break</i>	Quiz: Structure and Bonding Retake: Redox Chemistry: Latimer/Frost
<b>8 (10/10-10/16)</b>	<b>Topic 5: Crystal/Ligand Field Theory</b> Topic 6: Spectroscopy	Quiz: Crystal and Ligand Field Theory Retake: Structure and Bonding
<b>9 (10/17-10/23)</b>	Topic 7: Mechanisms	<b>Cumulative Challenge 2 (Topics 1–6)</b> Retake: Crystal and Ligand Field Theory
<b>10 (10/24-10/30)</b>	Topic 8: Organometallic Chemistry 1	Quiz: Mechanisms
<b>11 (10/31-11/6)</b>	<b>Topic 8: Organometallic Chemistry 2</b>	Retake: Mechanisms
<b>12 (11/7-11/13)</b>	Topic 9: Bioinorganic Chemistry Topic 10: Nuclear Chemistry	Quiz: Organometallic Chemistry You Teach! Activity 2
<b>13 (11/14-11/20)</b>	Topic 10: Nuclear Chemistry	<b>Cumulative Challenge 3 (Topics 1–9)</b> Retake: Organometallic Chemistry
<b>14 (11/21-11/27)</b>	<i>No class this week: Thanksgiving Break</i>	
<b>15 (11/28-12/4)</b>	Topic 11: Solid State Chemistry	Peer Review Quiz: Nuclear Chemistry
<b>16 (12/5-12/11)</b>	Review Week: ACS Foundations Exam	Quiz: Solid State Chemistry Retake: Nuclear Chemistry You Teach! Activity 2 Revision
<b>Finals (12/12-12/17)</b>	<b>Final: Monday, 12/13 (12:35 – 2:35 pm)</b>	Motivation Survey Self-Efficacy Survey Post-test <b>Final Challenge (all Topics)</b>