

# N330: INTERMEDIATE INORGANIC CHEMISTRY

Department of Chemistry, Indiana University, Bloomington

## Instructors: *Lecture*

Prof. Cathrine Reck

[creck@indiana.edu](mailto:creck@indiana.edu)

Chemistry C021

Office Hours: *MW* 10:30-11:30am, *M* 3:30-4:30 pm

## *Laboratory*

Prof. Norman Dean

[nsdean@indiana.edu](mailto:nsdean@indiana.edu)

Chemistry C021

Office Hours: *T* 3:30-4:30 pm

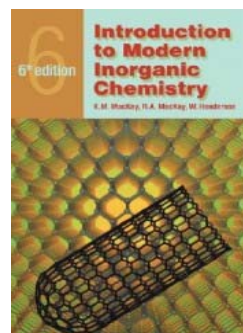
<b>Lecture:</b>	MWF	2:30 – 3:20 pm	CH 122
	T (exams)	7:15 – 9:15 pm	<b>TBD</b>
<b>Lab Lecture:</b>	T	2:30 – 3:20 pm	CH 122

<b>Discussion:</b>	9808	3:35P-04:25P	M	BH 144	Joan Walker (jomwalke)
	9809	4:40P-05:30P	M	PY 111	Joan Walker (jomwalke)
	9811	4:40P-05:30P	T	BH 305	Joan Walker (jomwalke)
	9812	3:35P-04:25P	W	BH 144	Sabine Abb (sabb)
	9810	5:45P-06:35P	W	WY 111	Sabine Abb (sabb)

<b>Lab Times:</b>	9814	10:45A-02:15P	W	CH 045	Junyong Jo (jo6)
	9815	4:00P-07:30P	W	CH 045	Yi Zhou (yz26)
	9816	9:00A-12:30P	R	CH 045	Alice Hui (akhui)
	9819	9:00A-12:30P	R	CH 041	Elizabeth Wagoner (erwagone)
	9817	1:00P-04:30P	R	CH 045	Brittany Kish (smithbp)
	9820	1:00P-04:30P	R	CH 041	Andrey Malyutin (agmalyut)
	9818	5:00P-08:30P	R	CH 045	Andrew Storey (apstorey)
	9821	5:00P-08:30P	R	CH 041	Sarah Lindahl (slindahl)
	9822	10:45A-02:15P	F	CH 041	Christopher DeSantis (cdesanti)
	9823	10:45A-02:15P	F	CH 045	Tao He (heta)
	29676	3:30P-07:00P	F	CH 045	Edward Witlicki (ewitlick)

**Texts:** (MMH) *Introduction to Modern Inorganic Chemistry*, K. M. Mackay, R. A. Mackay, & W. Henderson, 6<sup>th</sup> edition, Nelson Thornes Publishing., 2002. ISBN 0-7487-6420-8

(MSJ) *Chemistry, The Molecular Science*, 3<sup>rd</sup> edition, Moore, Stanitski & Jurs, Brooks Cole, 2007; used for topics Nuclear and Oxidation/Reduction only.



**Topics:** N330 will cover the following general topics:

- Nuclear Chemistry (text used is MJS)
- Electrochemistry/Redox (text used is MJS)
- Molecular Chemical Bonding
- Inorganic Solids/Solid State
- Transition Metal/Coordination Chemistry
- Organometallic Complexes & Catalysis
- Bioinorganic Chemistry (online notes and supplements)

**Expectations:** This class relies on your knowledge of both the foundations of general chemistry and organic chemistry. If you do not remember something from a previous course, then make note of it, look it up or ask for help; do not let it go. I am willing to review some material as needed (and if asked), but the onus is on the student to review material from previous semesters that you need to understand the material better. There is just no way to learn new material and keep reviewing old coursework, too, especially in summer.

**Website:** Lecture notes and handouts (e.g., answer keys, supplemental info) will be made available at <http://courses.chem.indiana.edu/>; from this site select **N330**. As this class does not have an ideal textbook, there will supplemental information posted on the website as needed. The MMH text and lab manual may not include all the specific topics that will be addressed in the notes, so the lecture notes and website will be pivotal in addition to any closed reserve material. For example, nuclear chemistry is not covered in the textbook, so problem sets, lecture notes and website links may be important to enhance your learning of the material.

**Evaluation:**

4 Examinations (125 points each)	= 500
4 Quizzes (30 points each, drop lowest)	= 90
3 Written Assignments (20 points)	= <u>60</u>
	= 650 lecture
Lab points (374 points called to 40% of the class total)	= <u>433 lab</u>
	= 1083 total

**The laboratory portion will be 40% of your overall grade; see lab syllabus for its point break down.**

There will be **four examinations** (Sep 29, Oct 27, Nov 17, Dec 18), each worth 125 points, will be scheduled through the semester. Each examination will be designed to test your knowledge and understanding of the material covered in the lectures prior to that examination and will by default be somewhat cumulative. **There will be no dropped exams, so please do not ask about it.** Exams will consist of short answer essay-style questions similar to that in organic chemistry; however, you can expect more essay-style questions rather than writing mechanisms.

Throughout the semester, a total of **four announced quizzes** (30 points, lowest one dropped) will be given during lecture. These quizzes will consist of short answer questions that deal with concepts covered in the preceding week; they are designed to encourage regular reading and study of the course material. **If you miss a quiz, that will be used as your drop quiz.**

Three short 2-page written assignments (20 points each) will be assigned throughout the semester asking you to synthesize what you are learning in class and apply it to a new topic.

Homework problems will be assigned for your benefit, but they will not be collected nor graded. At this point in your college career, you should be expected to work on problems, seek help when needed and determine for yourself what you do and do not know.

**Attendance:** You are expected to attend every lecture, lab & discussion. Grades in chemistry courses are usually reflected in lecture/discussion attendance. Students who do not perform well in the class are habitually the same students who do not attend lecture and who do not work homework problems for themselves. Students are responsible for the information given during the lecture period and the material in the textbook. I respectfully ask that you come to class on time and leave at the end of the hour. If you have any habitual problems about coming in late or leaving early, I ask that you let me know as to the reason.

**Absences:** An unexcused absence is an automatic zero for the exam or quiz that you missed. An excused absence may be granted by the course instructor only (not an AI) with advanced notice and appropriate documentation. I am very happy to work with you to have you take assignments early (within reason) if you know you are going to be gone.

If you anticipate that you will have an excused absence on a day that an exam or quiz is scheduled (University athletic event or religious holiday), you are required to make arrangements as early as possible in advance of the exam or quiz date. Examples of excused absences granted in the past include documented serious illness, a death in the family or attendance to a national conference. Excused absences will not be given to travel home or to attend a social event. **Since this is a large summer class, please plan to take your exams at the scheduled time.**

**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 & Conduct*. This a publication put out by the Student Ethics Office located at 705 E. 7<sup>th</sup> Street. 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.

Specific violations would be the intentional use of any unauthorized study aids, equipment, or another's work during an assignment (i.e., cheating) or allowing/aiding another individual to cheat from your information. Copying another student's work is considered a form of cheating and will be dealt with according to the Code of Academic Ethics described in the Schedule of Classes.

**Study Hints:**

1. READ THE ASSIGNED READING BEFORE COMING TO THE LECTURE!!!!!!
2. Write down questions you have during lecture, right after lecture, while reading and doing homework. Read over the lecture notes the same day to fill in gaps that you can still remember.
3. Do all the suggested homework problems.
4. Get help early! Do **NOT** wait until the night before to cram in all the information. Visit the office hours early & often!
5. Do not miss lecture. There is no good substitute for taking your own lecture notes. Just copying a friend's notes does **NOT** do the same thing for your understanding of the concepts.

6. If you are not doing well in the class, it will be your fault for not taking the necessary actions to seek and obtain help.

**Tentative Syllabus:** This is a tentative outline, not a contract. Although I will attempt to maintain this schedule, it may be subject to change. Please monitor these changes at the course website.

Week	Date	Topic	Suggested Reading Assignments
<b>1</b>			
Mon	Aug 31	Syllabus & Introduction	
Tue	Sep 1	<i>Lab Lecture</i>	
Wed	Sep 2	Nuclear Properties	Chapter 20 (MSJ)
Fri	Sep 4	Nuclear Properties	Chapter 20 (MSJ)
<b>2</b>			
Mon	Sep 7	Nuclear Properties	Chapter 20 (MSJ)
Tue	Sep 8	<i>Lab Lecture</i>	
Wed	Sep 9	Nuclear Properties	Chapter 20 (MSJ)
Fri	Sep 11	Nuclear Properties	Chapter 20 (MSJ)
<b>3</b>			
Mon	Sep 14	Oxidation/Reduction	Chapter 19 (MSJ)
Tue	Sep 15	<i>Lab Lecture</i>	
Wed	Sep 16	Oxidation/Reduction	Chapter 19 (MSJ)
Fri	Sep 18	Oxidation/Reduction	Chapter 19 (MSJ)
<b>4</b>			
Mon	Sep 21	Oxidation/Reduction	Chapter 19 (MSJ)
Tue	Sep 22	<i>Lab Lecture</i>	
Wed	Sep 23	Oxidation/Reduction	Chapter 19 (MSJ)
Fri	Sep 25	Oxidation/Reduction	Chapter 19 (MSJ)
<b>5</b>			
Mon	Sep 28	Molecular Structure & Bonding	Chapter 3/4 (MMH)
Tue	Sep 29	<i>Lab Lecture</i>	
		<b>Exam 1</b>	
Wed	Sep 30	Molecular Structure & Bonding	Chapter 3/4 (MMH)
Fri	Oct 2	Molecular Structure & Bonding	Chapter 3/4 (MMH)
<b>6</b>			
Mon	Oct 5	Solid State/Semiconductors	Chapter 5 (MMH)
Tue	Oct 6	<i>Lab Lecture</i>	
Wed	Oct 7	Solid State/Semiconductors	Chapter 5 (MMH)
Fri	Oct 9	Solid State/Semiconductors	Chapter 5 (MMH)
<b>7</b>			
Mon	Oct 12	Solid State/Semiconductors	Chapter 5 (MMH)
Tue	Oct 13	<i>Lab Lecture</i>	
Wed	Oct 14	Solid State/Semiconductors	Chapter 5 (MMH)
Fri	Oct 16	<i>Silicon Appreciation Day</i>	class notes and website
<b>8</b>			
Mon	Oct 19	Transition Metal Complexes	Chapter 13(14/15) (MMH)
Tue	Oct 20	<i>Lab Lecture</i>	
Wed	Oct 21	Transition Metal Complexes	Chapter 13(14/15) (MMH)
Fri	Oct 23	Transition Metal Complexes	Chapter 13(14/15) (MMH)

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Mon	Oct 26	Transition Metal Complexes	Chapter 13(14/15) (MMH)
Tue	Oct 27	<i>Lab Lecture</i>	
		<b>Exam 2</b>	
Wed	Oct 28	Transition Metal Complexes	<b>(Last day to drop with automatic "W")</b>
Fri	Oct 30	Transition Metal Complexes	Chapter 13(14/15) (MMH)

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Mon	Nov 2	Transition Metal Complexes	Chapter 13(14/15) (MMH)
Tue	Nov 3	<i>Lab Lecture</i>	
Wed	Nov 4	Transition Metal Complexes	Chapter 13(14/15) (MMH)
Fri	Nov 6	Transition Metal Complexes	Chapter 13(14/15) (MMH)

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Mon	Nov 9	Transition Metal Complexes	Chapter 13(14/15) (MMH)
Tue	Nov 10	<i>Lab Lecture</i>	
Wed	Nov 11	Organometallic Complexes	Chapter 16 (MMH)
Fri	Nov 13	Organometallic Complexes	Chapter 16 (MMH)

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Mon	Nov 16	Organometallic Complexes	Chapter 16 (MMH)
Tue	Nov 17	<i>Lab Lecture</i>	
		<b>Exam 3</b>	
Wed	Nov 18	Organometallic Complexes	Chapter 16 (MMH)
Fri	Nov 20	Organometallic Complexes	Chapter 16 (MMH)

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Mon	Nov 23	Organometallic Complexes	Chapter 16 (MMH)
Tue	Nov 24	<i>Lab Lecture</i>	
Wed	Nov 25	<i>Thanksgiving Break</i>	
Fri	Nov 27	<i>Thanksgiving Break</i>	

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Mon	Nov 30	Organometallic Complexes	Chapter 16 (MMH)
Tue	Dec 1	<i>Lab Lecture</i>	
Wed	Dec 2	Bioinorganic Chemistry	notes & website
Fri	Dec 4	Bioinorganic Chemistry	notes & website

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Mon	Dec 7	Bioinorganic Chemistry	notes & website
Tue	Dec 8	<i>Lab Lecture</i>	
Wed	Dec 9	Bioinorganic Chemistry	notes & website
Fri	Dec 11	Bioinorganic Chemistry	notes & website

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Fri	Dec 18	<b>Exam 4, 2:45 – 4:45 pm</b>	
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