

Chemistry 341
Inorganic Chemistry
Spring 2016

Course Instructor: Professor Stephen Dunham
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Class Meetings: M, W, F 11:45-12:55, Collier 205

Office Hrs: Posted each week on **blackboard**, or by appointment.

Lab: R 8:30-11:30, 211 Collier

Required Materials:

Text: Inorganic Chemistry, 4th by Gary L. Miessler, and Donald A. Tarr, 2011, Prentice Hall, or 5th Ed Gary L. Miessler, Paul J. Fisher, and Donald A. Tarr, 2014, Pearson.

Sapling account: You are required to register with Sapling Online Learning System and complete online homework assignments throughout the semester. Instructions to access Sapling are printed on the last page of this syllabus and posted on the course Canvas site.

Homework Journal: You are required to keep a written journal of your calculations and comments on your Sapling homework.

Scientific Calculator: Must be able to calculate logs, exponents, sci. notation
No smart phones or apps can be used on quizzes or exams!

Canvas Web Site: <http://canvas.moravian.edu/>
Throughout the semester, all handouts and announcements will be posted to the course canvas page.

Course Goals:

- This course is a one-semester introduction to the field of Inorganic Chemistry. Since a limited time is available, this course will present a survey of both theoretical and descriptive topics in Inorganic Chemistry. The laboratory will involve the synthesis and properties of inorganic and organometallic compounds.
- Recognize relationships between physical properties of matter and their physical state and molecular structure, including solubility, rates of reaction, acid-base properties, oxidation-reduction reactivity, and equilibrium processes.
- Apply qualitative and quantitative aspects of chemistry to determine bonding related properties of molecules, including electron organization, spectroscopic properties, and fundamental mechanisms of ligand substitution.
- Use the scientific method to actively seek knowledge through the study of chemical processes in a laboratory environment.

Attendance: It will be *very difficult* for you to learn chemistry concepts and follow them over the semester if you are not engaged in this course (in class, activities, homework, and labs). As a reminder, the college policy on attendance can be found at <http://www.moravian.edu/studentLife/handbook/academic/academic.html> If you anticipate an unavoidable absence, please **notify your instructor ASAP before** you are absent. Makeup quizzes, labs, and exams are given at the discretion of the instructor.

Academic Honesty: Please be familiar with the college policy on academic honesty <http://www.moravian.edu/studentLife/handbook/academic/academic2.html> Because this course involves small group learning activities, each student may exchange experimental details and data with her/his group. However, any work submitted in your name is to be your work alone. You are encouraged to discuss work with others on homework, but merely copying answers is not acceptable.

Learning Differences: Students who wish to request accommodations in this class for a disability should contact the Academic Support Center, located in the lower level of Monocacy Hall, or by calling 610-861-1401. Accommodations cannot be provided until authorization is received from the Academic & Disability Support office.

Grading: You are not in competition with anyone else in this class. Your grade will be determined only by the percentage of the total points you achieve. In the event that the class average on any exam, quiz, or lab falls below 75%, that score will be curved so that the class average is 75%.

Percentage Based Grading Scale

97-100	A !	80-82	B-	63-66	D
93-96	A	77-79	C+	60-62	D-
90-92	A-	73-76	C	< 60	F
87-89	B+	70-72	C-		
83-86	B	67-69	D+		

There are a total of 1000 pts that will be factored into your final grade in this course. Points on an exam, quiz, homework, or laboratory count the same amount.

Exams (2@100pts each)	200pts
Final Exam	150pts
Quizzes (10@15pts each)	150pts
Online Homework (10@15pts each)	150pts
Presentation and Laboratory Writing (50+10@10pts each)	150pts
Laboratory (10@20pts each)	200pts
Total	1000pts

Exams: Two in-class exams (100pts each) and one final (150pts).

While the material you will be responsible for on each exam could vary, (dependent upon the pace of the course) the following dates will be used for examinations:

Exam 1	Friday, February 26
Exam 2	Friday, April 8
Final	Tuesday, May 3, 3-5 PM

Quizzes: After completing a section of the text and a related homework assignment, a quiz will be given that will provide examples of questions and format that will appear on the exam. Quizzes will have two parts. You will first take the quiz as an individual and submit your answers. You will then take the quiz in a small group of 3-4 students submitting one set of answers as a group. Your quiz score will be 9pts individual score and 6 pts group score.

Ten quiz scores will be combined for your semester quiz grade.

Homework: Online homework will be assigned and scored through the Sapling Online Learning System (see Sapling Access instructions at the end of this document). Assignments will typically be due one week after they are assigned. Ten homework scores will be combined for your semester homework grade.

Writing and Presentations: Short writing assignments will follow each laboratory. These assignments will be done in the format required by the journal *Inorganic Chemistry* (see the journal's "Guidelines for Authors" PDF posted on the Canvas page), will be based on data you collect in the laboratory portion of this course, and will be submitted electronically as described by your instructor.

You will be asked to prepare and give presentations (a brief talk and/or scientific poster) based upon a literature topic of your choice. Details and timelines for these scientific presentations will be posted and discussed later.

Labs: Grading will be 20pts per week with 5pts prelab, 10 pts in lab, and 5 pts post lab. Your top 10 labs will count as your lab score for the semester.

Makeup Quizzes, Labs, and Exams: You are responsible for understanding the content of the material covered during a missed quiz or lab. Makeup exams, labs, or quizzes will be given at the discretion of the instructor for absences that have been documented by the Dean of Students Office and/or a health professional.

Class Etiquette:

- Turn off or silence cell phones! NO-text messaging during class
- Do not record sound or photos of classmates or instructors without permission

Email Etiquette: Although email may seem like an instantaneous form of communication, it is not. Just because you sent me an email, does not mean that I have: 1) read it, 2) understood it, and/or 3) approved any requests you made in it.

- I will reply individually, or as a class response to all email received.
- Assume that email sent between the hours of 9PM and 9AM has NOT been read.

Pace of the Course: The schedule below should be used as a guide for anticipated course coverage this semester.

Week Beginning		Anticipated Text Coverage	
Jan	18	Ch # 1-2	Intro to Inorganic, Atomic Structure
Jan	25	Ch # 2-3	Simple Bonding Theory
Feb	1	Ch # 3-4	Symmetry and Group Theory
Feb	8	Ch # 4-5	Molecular Orbital Theory
Feb	15	Ch # 5-6	Acid-Base Chemistry
Feb	22	Ch # 6-7	Crystalline Solid State, <u>Exam 1, 2/27, CH 1-5</u>
Feb	29	Ch #7, 9	Coord. Chem I, Structures
Mar	7	<i>SPRING BREAK</i>	
Mar	14	Ch # 10	Coord. Chem II, Bonding
Mar	21	Ch # 11	Coord. Chem. III, Electronic Spectra
Mar	28	Ch # 12	Coord. Chem. IV, Reactions and Mechanism
April	4	Ch # 13	Organometallic Chemistry, <u>Exam 2, 4/8, CH 6-7,9-12</u>
April	11	Ch # 14	Org Met. Reactions and Catalysis
April	18	Ch # 15-16	Metal Clusters, Bioinorganic
April	25	Ch # 16	Bioinorganic
May	2	Final Exam	<u>May 3, 3-5pm CH 13-16, and Cumulative</u>

Access Instructions for the Sapling Online Learning System:

- Go to <http://www2.saplinglearning.com/> and click on "US Higher Ed" at the top right.
- (A) If you already have a Sapling Learning account, log in and then skip to step 3. (B) If you have Facebook account, you can use it to quickly create a Sapling Learning account. Click "Create an Account", then "Create my account through Facebook". You will be prompted to log into Facebook if you aren't already. Choose a username and password, then click "Link Account". You can then skip to step 3.
(C) Otherwise, click "create account". Supply the requested information and click "Create my new account". Check your email (and spam filter) for a message from Sapling Learning and click on the link provided in that email.
- Find THIS course in the list and click the link. THIS course is **Moravian College-CHEM341-Spring 16-DUNHAM**. Note that you may need to expand the subject and term categories.
- To access the course you can either:
 - Enter a key code (that you can purchase in the Campus Bookstore) when prompted, or
 - Pay Sapling directly -- just select a payment option and follow the remaining instructions.
- If you have not had prior experience with Sapling Learning, it is strongly recommended that you work through the training materials. The activities, videos, and information pages will familiarize you with the Sapling Learning user environment and serve as tutorials for efficient balancing of equations, drawing of molecules, and other chemistry-specific tasks within the Sapling Learning answer modules. These training materials are already accessible in the Sapling Learning course.

Once you have registered and enrolled, you can log in at any time to complete (during the available window) or review your homework assignments. During sign up - and throughout the term - if you have any technical problems or grading issues, send an email to support@saplinglearning.com explaining the issue. The Sapling support team is almost always faster and better able to resolve issues than your instructor.

Laboratory

Labs will typically be done as a group of two students. You should plan on switching partners on a regular basis.

Each student will record their own lab notes for this course. You can choose to use either a hard-bound notebook, or use an **electronic laboratory notebook (ELN)**. The ELN is typically a MS-word file with digital ink. If you choose ELN, a backup of the document should be saved on a local drive incase your computer crashes during lab, or you do not have access to the cloud i.e. Google docs.

- Write legibly. Do not erase any mistakes. You may cross-out erroneous entries but they must remain legible. Be sure to explain any such errors.
- Write directly into your notebook. When preparing for lab, reading literature for lab, and during lab, be sure to take notes directly into your notebook. A clear outline format in your notebook, without full sentences, is just fine. Be concise!
- Include references. If you find an important/pertinent piece of information someplace else (such as in a book, catalogue, journal article, or on a reputable web site) copy the reference information directly into your notebook – Include enough information so you could find it again if you had to!
- Format. The notebook entry for an experiment will generally include:
 TITLE, DATE, LAB PARTNER.
 PROCEDURE. Outline what you DID in lab, not what you SHOULD HAVE done. Note any modifications of the procedure given in the lab handout.
 RAW DATA. Record all data directly into your notebook or an Excel spreadsheet and never on loose paper. Data should be clearly and neatly labeled.
 RESULTS/DISCUSSION. This should be a short narrative that describes your work up and analysis of raw data, and your interpretation of what these data mean for the overall goal(s) of the lab.
 REFERENCES. References and/or electronic links to information not provided in your lab notebook. Links should take a reader **directly** to the journal or web sites. Note if the journal is available at Moravian, you need to link directly to it, not to another source.

TENTATIVE Laboratory Schedule

<u>Week</u>	<u>Laboratory</u>	<u>Week</u>	<u>Laboratory</u>
1	Data base searches	8	Spring Break
2	Boranes w1	9	M(acac) ₃ synth and crystal growing
3	Boranes w2	10	Electronic spectra
4	M-M bonds	11	Easter Break
5	Ligand basicity	12	Mechanism
6	Quantum dots	13	Organometallics
7	Werner compounds	14	Bioinorganic