

# CHE 385: Inorganic Chemistry II

## Course syllabus – Spring 2012

MTWF 9:00 – 9:50 am

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Office hours: Drop in or make an appointment

**Introduction:** Inorganic chemistry II is a technical elective that can be taken as part of the biochemistry or chemistry major and is a required course for the professional chemistry track at Gustavus. Course content includes symmetry and group theory, molecular orbital theory, structure and reaction of coordination and organometallic compounds, physical methods for characterization of inorganic compounds, and topics in bioinorganic and materials chemistry.

Inorganic chemistry II is not simply a more advanced continuation of Inorganic chemistry I; instead, the two courses are approached in quite different ways. Inorganic I uses what we call a “descriptive” approach, in which the chemical behavior of the elements is systematically explored. Inorganic II is instead a course in which an understanding of methods and tools for understanding molecular behavior and spectroscopy is developed (eg, molecular orbital theory).

There is a vast and ever-increasing amount of scientific information in the world, and it is constantly being developed, challenged, and changed. No one scientist could be expected to learn and remember it all, and even if one could, there are limits to scientific knowledge. It is therefore crucial that scientists have a well-developed ability to “figure stuff out.” When faced with a question, chemists use a combination of their chemical knowledge, the scientific literature, logic, and experiment to address that question. This course is designed to develop your ability to use all of these strategies to answer your questions about chemistry.

### *Course goals:*

- To increase your knowledge of inorganic chemistry, specifically the topics listed above
- To develop your information literacy and critical thinking skills so you can effectively and independently use the vast stores of existing chemical information
- To develop your experimental design and problem-solving skills so you can use the scientific method to address new questions
- To improve your written and oral communication skills, including solid argument construction

### *Course materials:*

- *Required text:* Miessler & Tarr, Inorganic Chemistry, 3<sup>rd</sup> ed., Prentice Hall
- *Required materials:* Bound lab notebook (one per laboratory group) and safety glasses
- *Recommended materials:* Model kit suitable for inorganic chemistry
- *Recommended text:* ACS Style Guide (also on reserve in the library)

### *Shared materials (online and physical):*

- Class, lab, and assignment schedule (updated frequently on Moodle)
- Course handouts including assignment information (on Moodle)

- Links to helpful web sites and journals (on Moodle; please suggest more!)
- Alternate textbooks, laboratory manuals, and reference books (on reserve in the library)

**Office hours:** Feel free to drop in or e-mail me to make an appointment. I intend to challenge you, but I also intend to help you succeed, so see me if you have any questions about any aspect of this course. Please note that I am not available in the mornings before class.

**Preparation for class.** Check the schedule on Moodle regularly to find the readings and topics for upcoming classes, as well as deadlines for assignments. Readings will include sections of our textbook and other sources provided on Moodle; I also list optional readings from books on reserve in the library in case you want further help on a topic. In some cases, you may find you do not remember material from a prerequisite course; if this occurs, you will need to learn or review material outside of class time.

**Homework.** Homework will be assigned to help you learn and practice course material, critical thinking, information literacy, argument construction, and problem-solving skills. Homework may consist of problems, short writing assignments, short in-class presentations, writing your own exam questions, or literature search and summary assignments.

Problem-based assignments will be turned in at the beginning of class on the due date. Some questions will be discussed during class, some questions will be graded by me, and others may not be discussed or graded, but answer keys will be posted. Late homework is rarely accepted; if you must miss class on the day homework is due, turn your assignment in early. You are encouraged to work with other class members, but you must complete the assignment for yourself.

**Quizzes:** Review quizzes are occasionally given to help you check your recall of material learned in previous classes. The goal of these quizzes is to help you identify areas that you might need to review, so you may re-take these quizzes up to 2 times for a better grade.

**Research proposal:** This course is designated WRIT-D. The major writing assignment is an original research proposal on a topic of your choice related to inorganic chemistry. One or more shorter writing or speaking assignments may precede the proposal to help you prepare and develop your ideas. For some pieces, you will be expected to turn in one or more drafts before the final version; no points will be awarded unless/until you submit all required drafts.

**Exams:** There will be 4 exams, including a final exam. All exams will be at least partially comprehensive. Exams typically consist of a short in-class (closed-book) portion and a longer take-home (open book, but limited resources) portion. The most likely exam dates are around 3/2, 4/6, and 5/2. The final exam is scheduled for Saturday, 5/19 at 1-3 pm.

**Laboratory:** Laboratory meets on Mondays from 2:30 – 6:30 pm in Nobel 306. Your grade will be based on your work in the lab, experimental design, group meeting presentations and participation, and your group notebook. Please refer to the lab syllabus for more information.

**Grades:** Grading may be flexible if I feel the grades do not reflect the level of achievement with respect to the course goals. *Most likely* breakdown:

A	94-100%
A-	90-93%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D	60-69%
F	< 60%

<i>Exam1:</i>	10%
<i>Exam2:</i>	10%
<i>Exam3:</i>	10%
<i>Final exam:</i>	10%
<i>Quizzes</i>	5%
<i>Homework:</i>	15%
<i>Writing project:</i>	20%
<i>Lab:</i>	20%

**Honor code:** As members of the Gustavus Adolphus College community of scholars, you and I have agreed to abide by an excellent honor code. I believe this code enhances a culture of trust between us. **I trust that you all have intentions of total academic honesty, but I also recognize that learning the finer points of academic honesty is part of your college education.** Sometimes, the details of academic honesty are not perfectly clear to students, particularly in writing assignments. Please come to me with any questions you may have.

All assignments, quizzes, exams, and laboratory exercises must be completed only using the allowed resources; please be sure you understand which resources you are allowed to use. Using a solutions manual from any source to help you complete the homework is not allowed, for example. Collaboration or group work is allowed on some activities (such as homework) and not others (such as exams). In any case, except for group assignments (such as the lab notebooks), each individual should submit his or her own work. Any kind of dishonesty with the intent of gaining an academic advantage (*i.e.*, lying about the reason for missing an exam or lab period) will be considered academic dishonesty by this instructor. Under our code, you are not expected to police others' actions, but if you become aware of honor code violations, keeping silent about them is itself an honor code violation.

Any student found in violation of the academic honesty policy and honor code will receive a grade of 0 for that assignment or exam. A second offense will result in an F for the course. The Provost's office will be notified of all offenses.

**Accommodations:** If you have a documented physical, medical, psychiatric, attentional, or learning disability (or you think you have such a disability) and require accommodations to help you fulfill course expectations, you should meet with the Disability Services Coordinator for a confidential discussion about reasonable academic accommodations. I am committed to helping you to succeed in this class, but I cannot make academic accommodations without supporting documentation from Disability Services, and accommodations cannot be made retroactively, so do set up that meeting as early as possible.

If you are an English Language Learner, please know that there is support available for you in the Writing Center. In addition to help with your writing skills, this person may be able to help you if you are having other class-based challenges, such as struggling to finish exams on time because it takes you longer to read and interpret the questions and write down your answers.