

**CHMD69- Bioinorganic Chemistry**  
**Fall 2011**  
**University of Toronto at Scarborough**

**Instructor**

Professor H. Bernie Kraatz: SW632, Email: [bernie.kraatz@utoronto.ca](mailto:bernie.kraatz@utoronto.ca)  
Office Hours: Fri 4:00-5:30 pm in SW632

**Email Policy**

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**Course Description**

The course describes the essential inorganic chemistry found in biological systems and is building on concepts acquired in earlier inorganic courses. In addition, fundamental concepts related to the function and use of metals in biological systems, including some recent research on bionanotechnology and medicinal chemistry. Spectroscopic techniques will be introduced as needed.

Topics covered in this course include:

- an overview of biological ligands
- an overview of the general concepts in coordination chemistry.
- the biodistribution of metals.
- metal toxicity, including mercury and arsenic.
- the application of metal complexes in medicine.
- bioorganometallic chemistry, including cobalt complexes.
- nucleic acids and metals.
- zinc enzymes.
- iron proteins and oxygen transport, cytochrome P450 and related chemistry.
- molybdenum enzymes and related systems.
- nitrogenase and hydrogenase.

The class will be highly interactive and will require ongoing participation in a "question and answer"-style lecture. Please read ahead.

**Method of Evaluation**

Short In-Class Presentation (15%) – begin Tuesday Nov 11  
One Midterm Exam (25%) – Tuesday, October 21 (in class)  
Final Examination (60%) – to be scheduled by UTSC

**Suggested Texts**

Kraatz, Metzler-Nolte "Concepts and Models in Bioinorganic Chemistry", Wiley-VCH  
Lippard, Berg, "Principles of Bioinorganic Chemistry", University Science Press  
Bertini, Gray, Lippard and Valentine "Bioinorganic Chemistry", University Science Press

Kaim, Schwederski "Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life" Wiley  
Fausto da Silva and Williams "The Biological Chemistry of the Elements" Oxford Press

### **Accessibility**

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach us and/or the AccessAbility Services Office as soon as possible. We will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca).

### **Academic Integrity**

Academic integrity is one of the cornerstones of the University of Toronto. It is critically important both to maintain our community which honours the values of honesty, trust, respect, fairness and responsibility and to protect you, the students within this community, and the value of the degree towards which you are all working so diligently.

According to Section B of the University of Toronto's Code of Behaviour on Academic Matters <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm> which all students are expected to know and respect, it is an offence for students to:

- To use someone else's ideas or words in their own work without acknowledging that those ideas/words are not their own with a citation and quotation marks, i.e. to commit plagiarism.
- To include false, misleading or concocted citations in their work.
- To obtain unauthorized assistance on any assignment.
- To provide unauthorized assistance to another student. This includes showing another student completed work.
- To submit their own work for credit in more than one course without the permission of the instructor.
- To falsify or alter any documentation required by the University. This includes, but is not limited to, doctor's notes.
- To use or possess an unauthorized aid in any test or exam.

There are other offences covered under the Code, but these are by far the most common. Please respect these rules and the values which they protect. Offences against academic integrity will be dealt with according to the procedures outlined in the Code of Behaviour on Academic Matters.