Syllabus for Bioinorganic Chemistry (2 Credits, CH316):

2021-2022 Spring Semester

Course Description: Bioinorganic chemistry (or metals in biological systems) is a cross-discipline course, which covers inorganic chemistry, organic chemistry, physical chemistry and biochemistry. This course is targeted to senior undergraduate in chemistry who develop a strong background in inorganic chemistry and has strong interests in biological inorganic systems. This course will ***introduce basic and frontier concepts/knowledge*** of bioinorganic chemistry, such as molecular mechanisms of life, photosynthesis, nitrogen fixation. This course will ***outline*** general structures, functions and chemical reactions of some representative bioinorganic systems.

Instructor:
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Office hours: by appointments via an email

TA:
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Reference Textbooks (No Textbook is required; Lectures Notes are the enough for the quizzes):
1. "Biological Inorganic Chemistry", Bertini, I.; Gray, H. B.; Stiefel, E. I., Valentine, J. S. Eds. University Science Book, 2007 (the main reference book).
2. Biological Inorganic Chemistry: A New Introduction to Molecular Structure and Function", (2nd Ed.) Robert R. Crichton. Elsevier, 2012 (the main reference book; our school subscribed this ebook).
3. "Bioinorganic Chemistry: A Short Course", (2nd Ed.) Roat-Malone, R. John Wiley & Sons, Inc., 2007 (reference book; our school subscribed this ebook).
4. 生物无机化学导论(第3版) 计亮年, 毛宗万, 黄锦汪. 科学出版社 2010. Or 生物无机化学(第 1 版) 郭子建, 孙为银. 科学出版社 2014.
5. Review Literatures: Chemical Reviews 2014, 114, 3367-4620; Chemical Reviews 2005, 105, 1917–2722; Chemical Reviews 2004, 104, 347–1200 (reference papers).

Grading (Total: 100 %):
Quiz (e.g. multiple-choice and 1-2 mechanism or "metal-cluster" questions): 40%
Professional Essay: 30%;
Presentation: 20%
Class Performance: 10%

Academic Integrity and Honesty:

You are highly encouraged to discuss questions with the instructor, TA and/your classmates, but you must prepare your exam and your project by yourself (NOT copy from the others). Any forms of academic dishonesty are STRICTLY FORBIDDEN.

Tentative Lecture Schedule:

Lecture Time: Fri, 8:00-9:50 am Venue: Room 303 (Teaching Building I)

(The below schedule is still subject to change)

Week (dates)	Topics
1 (18 Feb)	I. Introduction & Overview: Coordination Chemistry
2 (25 Feb)	II. Metal Ions & Proteins: Binding, Folding Transport & Storage
3-4 (4 & 11 Mar)	III. Hydrolytic Chemistry
5-6 (18 & 25 Mar)	IV. Electron Transfer, Respiration & Photosynthesis
7 (1 Apr)	V. Metals in Medicine
7-9 (1, 8 & 15 Apr)	VI. Oxygen Metabolism
10-12 (22 & 29 Apr; 6 May)	VII. Hydrogen, Carbon, & Nitrogen Metabolism
12-14 (6, 13 & 20 May)	VIII. Metalloenzymes with Radical Intermediates
14 (20 May)	**Student Presentation**
15 (27 May)	**Course Review & Quiz**
16 (5 Jun)	**Essay Submission Deadline**