课程名（Coursename）
Bioinorganic Chemistry

课程代码（Coursenumber）
L3

课程对象（Audience）
Graduates

开课教师（Teacher）
Dr P. D. Barker

学期（Semester）

课程描述（Description））
This course brings together fundamental aspects of inorganic chemistry with biological chemistry. The basis of the course deals with the interaction of inorganic cofactors with biological molecules (mainly proteins) and how the fundamental chemistry of metallic elements is controlled and manipulated for catalytic and structural chemistry. This will be illustrated by recent structural, spectroscopic and mechanistic insights into calcium, zinc, copper, molybdenum and iron centres in proteins and enzymes.
Once we have considered the main metallic components of biology, we will then examine the principles underlying the use of metallic cofactors in complex, organised structures, for example in natural charge transfer processes. We will discover how multiple redox centres can be organised in a variety of ways for harnessing electrochemical and photochemical potential and also consider what chemists can learn from biological  systemsfor the construction of useful molecular electronic devices. Finally, we will examine how biology acquires metal ions and regulates their concentration in cells. This will lead on to consider the biological chemistry of heavy metals (e.g. Pb, Cd, Pt and Ru) and their complexes; their interaction with nucleic acids and the bases for the important anti-tumor activity of some Pt and Ru complexes.
This is a highly interdisciplinary course and calls upon basic IA and IB inorganic chemistry and redox chemistry, as well as some simple IB biochemistry. Prior knowledge of basic biomolecular structures is helpful but not essential.

课时信息（Totalhours）

教参信息（Textbookinfo）
1 Biological Inorganic Chemistry: An Introduction by Robert Crichton (Paperback - Jan. 1, 2008)
ISBN-13: 978-0444527400
世界各地拥有馆藏的图书馆（OCLC）:190
2 Bio-inorganic Hybrid Nanomaterials: Strategies, Syntheses, Characterization and Applications by Eduardo Ruiz-Hitzky, Katsuhiko Ariga, and Yuri M. Lvov (Hardcover - Feb. 15, 2008)
ISBN-13: 978-3527317189
世界各地拥有馆藏的图书馆（OCLC）:140
3 The Biological Chemistry of the Elements: The Inorganic Chemistry of Life by J. J. R. Fraústo da Silva and R. J. P. Williams (Paperback - Nov. 1, 2001)
ISBN-13: 978-0198508489
世界各地拥有馆藏的图书馆（OCLC）:364
4 Element Speciation in Bioinorganic Chemistry by Sergio Caroli (Hardcover - Apr. 5, 1996)
ISBN-13: 978-0471576419