课程名（Coursename）
Chemical Biology I – Biological Catalysis

课程代码（Coursenumber）
B3

课程对象（Audience）
Undergraduate

开课教师（Teacher）
Prof. C. Abell and Dr D. R. Spring

学期（Semester）
M 6–8 & L 1–3

课程描述（Description））
Enzymes are the main catalysts in the cell. They catalyse an amazing array of reactions, with high chemo-, regio- and stereoselectivity and at rate enhancements of up to 1015! Consequently, about half of the drugs currently being developed in the pharmaceutical industry are targeted at enzymes. It is therefore very important for us to understand how enzymes achieve catalysis, and how to use this information to design specific inhibitors. In IB some of the basic concepts behind enzymatic catalysis were introduced. Now we will build on that foundation and explain the diversity of chemical reactions that enzymes catalyse. The examples are chosen to illustrate how enzymes are studied and to introduce concepts that you will need for subsequent biological courses in Part III.
Prof. C. Abell
Topics Enzymes basics (a reprise). Carbon-carbon bond forming reactions, the biological aldol reaction, elimination reactions, irreversible inhibition; one carbon transfer; kinases and phosphatases, the role of protein phosphorylation, activation of oxygen.

Dr D. R. Spring
Topics Enzymes and Coenzymes. Vitamins; Reduction and Oxidation, NAD(P)H and Flavins; Thiamine Pyrophosphate (TPP)-Dependent Enzymes; Enzymatic Transformations of Amino Acids, PLP; Glucose Metabolism, Enzymes Work Together.

课时信息（Totalhours）

教参信息（Textbookinfo）
Recommended books
1 Molecular Aspects of Enzyme Catalysis by Toshio Fukui and Kenji Soda (Hardcover - May 25, 1994)
ISBN-13: 978-3527300174
2 Iron Catalysis in Organic Chemistry: Reactions and Applications by Bernd Plietker (Hardcover - Oct. 13, 2008)
ISBN-13: 978-3527319275
世界各地拥有馆藏的图书馆（OCLC）:125
3 Organometallic Chemistry and Catalysis by D. Astruc (Hardcover - Sept. 26, 2007)
ISBN-13: 978-3540461289
世界各地拥有馆藏的图书馆（OCLC）:133
4 Metal-Catalysis in Industrial Organic Processes by Gian Paolo Chiusoli and Peter Maitlis (Hardcover - Oct. 10, 2006)
ISBN-13: 978-0854048625
世界各地拥有馆藏的图书馆（OCLC）:78
5 Biological Molecules (Molecules and Cell Biochemistry) by C. Smith and E.J. Wood (Paperback - Oct. 10, 2008)
ISBN-13: 978-0412407802
世界各地拥有馆藏的图书馆（OCLC）:252
6 Mechanical Catalysis: Methods of Enzymatic, Homogeneous, and Heterogeneous Catalysis by Gerhard F. Swiegers (Hardcover - Sept. 29, 2008)
ISBN-13: 978-0470262023
世界各地拥有馆藏的图书馆（OCLC）:187
7 Supramolecular Catalysis by Piet W. N. M. van Leeuwen (Hardcover - Apr. 18, 2008)
ISBN-13: 978-3527321919
世界各地拥有馆藏的图书馆（OCLC）:113
8 Structure and Mechanism in Protein Science: A Guide to Enzyme Catalysis and Protein Folding by Alan Fersht (Hardcover - Sept. 15, 1998)
ISBN-13: 978-0716732686
9 Fuel Cell Catalysis: A Surface Science Approach (The Wiley Series on Electrocatalysis and Electrochemistry) by Andrzej Wieckowski and Marc Koper (Hardcover - Apr. 20, 2009)
ISBN-13: 978-0470131169
世界各地拥有馆藏的图书馆（OCLC）:149
10 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