课程名（Coursename）  
The Foundations of Organic Synthesis  
  
课程代码（Coursenumber）  
A2  
  
课程对象（Audience）  
Undergraduate  
  
开课教师（Teacher）  
Dr W. P. Nolan  
  
学期（Semester）  
M 1–5  
  
课程描述（Description））  
This course will apply the basic organic chemistry courses, Key Organic Reactions and Shape and Reactivity taught in IB Chemistry B to organic synthesis. You will see how a molecule can be logically dissected into simple building blocks by working backwards (retrosynthetic analysis) and how using these tools you will be able to devise synthetic strategies towards new molecules.  
Topics Retrosynthetic Analysis and the Language of Synthesis: Target Molecules. Disconnections. Synthetic equivalents. Criteria for Good Synthetic Planning C–X Disconnections: Synthesis of halides, ethers, sulphides and amines (considered as onegroup –X disconnections). Two-group disconnections illustrated by the synthesis of 1,1-, 2,2- and 1,3-difunctionalised compounds. C–C Disconnections and Synthesis using the Carbonyl Group: Carbonyl group as an a1 (acceptor) reagent. Alkene synthesis and the Wittig reaction.   
Carbonyl group as a d2 (donor) reagent. Enolate alkylations. The aldol condensation. Synthetic control in carbonyl condensations.unsaturated carbonyl compounds as a3 (acceptor) reagents. Synthesis of 1,5-dicarbonyl compounds. Construction of 1,4-difunctionalised compounds. Construction of 1,4-difunctionalised compounds using synthons of “unnatural” polarity. More Tools of the Trade: Synthesis of More Complex Systems. Control of Mixed Functionality. Use of Latent Functionality Concepts and Methods for Ring Synthesis: Heterocyclic. Carbocyclic  
  
课时信息（Totalhours）  
  
教参信息（Textbookinfo）  
Recommended books  
Warren, S., Organic Synthesis – The Disconnection Approach, Wiley 1982.  
Clayden, J., Greeves, N., Warren, S. and Wothers, P., Organic Chemistry, OUP 2000  
1 Elements of Synthesis Planning by R. W. Hoffmann (Paperback - Jan. 22, 2009)  
ISBN-13: 978-3540792192  
世界各地拥有馆藏的图书馆（OCLC）:61  
2 Organometallic Reagents in Organic Synthesis (Smithkline Beecham Research Symposium) by M. B. Mitchell and John E.G. Bateson (Hardcover - Mar. 30, 1994)  
ISBN-13: 978-0124991507  
3 Transition Metal Reagents and Catalysts: Innovations in Organic Synthesis by Jiro Tsuji (Paperback - Sept. 9, 2002)  
ISBN-13: 978-0471560272  
世界各地拥有馆藏的图书馆（OCLC）:246  
4 Organic Reactions in Water: Principles, Strategies and Applications by U. Marcus Lindstrom (Hardcover - May 4, 2007)  
ISBN-13: 978-1405138901  
世界各地拥有馆藏的图书馆（OCLC）:187  
5 Organomagnesium Methods in Organic Chemistry (Best Synthetic Methods) by Basil J. Wakefield (Hardcover - Apr. 26, 1995)  
ISBN-13: 978-0127309453  
6 Advances in Organometallic Chemistry, Vol. 27 by Author Unknown (Hardcover - Jan. 11, 1988)  
ISBN-13: 978-0120311279  
7 Speciality Chemicals: Innovations in industrial synthesis and applications by B. Pearson (Hardcover - Dec. 31, 1991)  
ISBN-13: 978-1851666461  
8 Organic Chemistry: A Guided Inquiry by Andrei Straumanis (Paperback - July 2, 2008)  
ISBN-13: 978-0618974122  
世界各地拥有馆藏的图书馆（OCLC）:45  
9 The Chemistry of Organocopper Compounds (PATAI'S Chemistry of Functional Groups) by Zvi Rappoport and Ilan Marek (Hardcover - Jan. 7, 2010)  
ISBN-13: 978-0470772966  
世界各地拥有馆藏的图书馆（OCLC）:54  
10 Organic Chemistry by J.W., Ph.D. Suggs and J.W. Suggs (Paperback - Oct. 31, 2001)  
ISBN-13: 978-0764119255  
世界各地拥有馆藏的图书馆（OCLC）:127  
11 Advanced Organic Chemistry, Fourth Edition - Part B: Reaction and Synthesis (Advanced Organic Chemistry / Part B: Reactions and Synthesis) by Francis A. Carey and Richard J. Sundberg (Paperback - May 2001)  
ISBN-13: 978-0306462450  
世界各地拥有馆藏的图书馆（OCLC）:476  
12 Reagents, Auxiliaries, and Catalysts for C-C Bond Formation, Handbook of Reagents for Organic Synthesis by Robert M. Coates and Scott E. Denmark (Hardcover - June 22, 1999)  
ISBN-13: 978-0471979241