课程名（Coursename）  
Advanced Diffraction Methods  
  
课程代码（Coursenumber）  
M2  
  
课程对象（Audience）  
Graduates  
  
开课教师（Teacher）  
Dr D. A. Jefferson  
  
学期（Semester）  
  
课程描述（Description）  
It will be assumed that students taking this course have followed the Part II course Diffraction Methods in Chemistry. This course builds on the diffraction course in Part II but extends the applications to a much greater range of materials, particularly those where large perfect single crystals are not obtainable, as is found in heterogeneous catalysts and non-stoichiometric compounds.   
In systems such as these, it is necessary either to utilise diffraction data from polycrystalline specimens or, if studies on single crystals are to be performed, to employ radiation having a much stronger interaction with matter. The course therefore deals with the use of x-ray and neutron diffraction with polycrystalline powders, concentrating particularly on the refinement of crystal structures, followed by the application of electron diffraction and high resolution atomic imaging methods in catalysis and nanoscience. The use of other electron-specimen interactions, such as x-ray emission spectroscopy and its application in nano-compositional studies in chemistry, is also discussed.  
  
课时信息（Totalhours）  
  
教参信息（Textbookinfo）  
1 Method of Difference Potentials and Its Applications (Springer Series in Computational Mathematics) by Viktor S. Ryaben'kii and N.K. Kulman (Hardcover - Dec. 12, 2001)  
ISBN-13: 978-3540426332  
世界各地拥有馆藏的图书馆（OCLC）:126  
2 Two Methods for the Exact Solution of Diffraction Problems (SPIE Press Monograph Vol. PM127) by Frederick E. Alzofon (Paperback - Nov. 26, 2003) - Illustrated  
ISBN-13: 978-0819451415  
世界各地拥有馆藏的图书馆（OCLC）:46  
3 X-ray Diffraction at Elevated Temperatures: A Method for In Situ Process Analysis by D. D. L. Chung, Patrick W. DeHaven, H. Arnold, and Debastis Ghosh (Hardcover - Feb. 26, 1993)  
ISBN-13: 978-0471187264  
4 Asymptotic Methods in Short-wavelength Diffraction Theory (Alpha Science Series on Wave Phenomena) by V. M. Babich (Hardcover - May 13, 2009)  
ISBN-13: 978-1842652329  
世界各地拥有馆藏的图书馆（OCLC）:42  
5 Methods of X-ray and Neutron Scattering in Polymer Science (Topics in Polymer Science) by R. J. Roe (Hardcover - Jan. 6, 2000)  
ISBN-13: 978-0195113211  
6 Methods for Computer Design of Diffractive Optical Elements (Wiley Series in Lasers and Applications) by Victor A. Soifer (Hardcover - Dec. 14, 2001)  
ISBN-13: 978-0471095330  
世界各地拥有馆藏的图书馆（OCLC）:113  
7 Diffraction-limited Imaging With Large and Moderate Telescopes by Swapan K. Saha (Hardcover - June 20, 2007)  
ISBN-13: 978-9812707772  
世界各地拥有馆藏的图书馆（OCLC）:86