Course Syllabus for “Methods of X-Ray and Neutron Scattering” (CH5306701) to be Taught at Spring Semester 2018

1. **Course Title**: Methods of X-Ray and Neutron Scattering (to be taught in English)
2. **No of Credit**: 3 (graduate elective course) (Wed. 11:20-12:10; Thur. 13:20-15:10)
3. **Instructor**: Yan-Jyi Huang (黃延吉 Office: E2 711; e-mail: huangyj@mail.ntust.edu.tw; course website: http://web.ntust.edu.tw/~HUANGYJ/xrd.htm)
4. **Classroom**: IB 510-2 (Wed.); IB 510-2 (Thur.)
5. **Synopsis and Schedule**:  
   (1) Synopsis:  
The objective of this course is to acquaint students of science and engineering with the fundamental principles for methods of X-ray and neutron scattering and their applications. The topics to be covered include: (i) X-rays and their interaction with matter, (ii) sources of X-rays, (iii) refraction and reflection from interfaces, (iv) kinematical diffraction, and (v) diffraction by perfect crystals  
   (2) Schedule:  
   Week 1 (3/1, 1) X-rays and their interaction with matter (Als-Nielsen Chap. 1; Roe Chap. 1)  
   Week 2 (3/7, 8, 8)  
   Week 3 (3/14, 15,15) Sources (Als-Nielsen Chap. 2; Roe Chap. 2)  
   Week 4 (3/21,22,22)  
   Week 5 (3/28,29,29)  
   Week 6 (4/4,5,5) No classes  
   Week 7 (4/11,12,12) Refraction and reflection from interfaces (Als-Nielsen Chap. 3; Roe Chap. 7)  
   Week 8 (4/18,19,19) 4/18 Midterm #1 (1 hr)  
   Week 9 (4/25,26,26)  
   Week 10 (5/2,3,3) Kinematical diffraction I: non-crystalline materials (Als-Nielsen Chap. 4; Roe Chaps. 4 and 5)  
   Week 11 (5/9,10, 10)  
   Week 12 (5/16,17,17)  
   Week 13 (5/23,24,24) Kinematical diffraction II: crystalline order (Als-Nielsen Chap. 5; Roe Chap. 3)  
   Week 14 (5/30,31,31) 5/30 Midterm #1 (1 hr)  
   Week 15 (6/6,6/7,7)  
   Week 16 (6/13,14,14) Diffraction by perfect crystals (Als-Nielsen Chap. 6; Roe Chap. 3)  
   Week 17 (6/20,21,21) 6/28 Final (2 hrs)
6. **Prerequisite**: No
7. **Textbook**:  

**Reference Books**:  
8. **Grading:**

Two Midterms (Apr. 18: May 30) (40%), One Final Exam (June 28) (30%), and Homework and Final Report (30%) (Topics of term paper to be selected from Roe’s Chaps. 3-7)