Course Syllabus for “Methods of X-Ray and Neutron Scattering” (CH5306701) to be Taught at Spring Semester 2016

1. **Course Title**: Methods of X-Ray and Neutron Scattering (to be taught in English)

2. **No of Credit**: 3 (graduate elective course) (Tue. 9:10-10:00; Thur. 10:20-12:10)

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 (Tue.); 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 (2/23, 25, 25) X-rays and their interaction with matter (Als-Nielsen Chap. 1; Roe Chap. 1)
   Week 2 (3/1, 3, 3)
   Week 3 (3/8, 10,10) Sources (Als-Nielsen Chap. 2; Roe Chap. 2)
   Week 4 (3/15,17,17)
   Week 5 (3/22,24,24)
   Week 6 (3/29,31,31) Refraction and reflection from interfaces (Als-Nielsen Chap. 3; Roe Chap. 7)
   Week 7 (4/7,7)
   Week 8 (4/12,14,14) 4/14 Midterm #1 (1 hr)
   Week 9 (4/19,21,21)
   Week 10 (4/26,28,28) Kinematical diffraction I: non-crystalline materials (Als-Nielsen Chap. 4; Roe Chaps. 4 and 5)
   Week 11 (5/3,5, 5)
   Week 12 (5/10,12,12)
   Week 13 (5/17,19,19) Kinematical diffraction II: crystalline order (Als-Nielsen Chap. 5; Roe Chap. 3)
   Week 14 (5/24,26,26) 5/26 Midterm #1 (1 hr)
   Week 15 (5/31,6/2,2)
   Week 16 (6/7) Diffraction by perfect crystals (Als-Nielsen Chap. 6; Roe Chap. 3)
   Week 17 (6/14,16,16) 6/23 Final (2 hrs)

6. **Prerequisite**: No


**Reference Books**:


(Note: The 3rd ed. is not recommended.)


8. **Grading:**

Two Midterms (Apr. 14; May 26)(40%), One Final Exam (June 23)(30%), and Homework and Final Report (30%) (Topics of term paper to be selected from Roe’s Chaps. 3-7)