

**ChE 386K**  
**X-Ray Diffraction Theory**  
**TTh 12:30pm – 2:00pm**

A combined introduction to symmetry operations, crystallographic symmetry, and the theoretical foundations of x-ray scattering with an emphasis on diffraction.

**Instructor:** Steve Swinnea (swinnea@che.utexas.edu)

**Office:** ETC 9.114 MW 2-3

**Phone:** 471-3173

**Texts:**

Recommended:

“The Basics of Crystallography and Diffraction,” Christopher Hammond.

Supplemental:

“Elements of X-Ray Crystallography,” I. V. Azaroff

“Elements of X-Ray Diffraction,” B. D. Cullity

“X-Ray Structure Determination, A Practical Guide,” G. Stout and L. H. Jensen

“Space Groups for Solid State Scientists,” G. Burns and A. M. Glazer

“Introduction to X-Ray Powder Diffractometry,” R. Jenkins and R. Snyder

**Topics:**

**I. Symmetry**

- A. Operators
- B. Plane Groups
- C. Point Groups
- D. Space Groups

**II. X-Ray Diffraction**

- A. Physics of X-Rays
- B. Powder Diffraction

**III. Single Crystal Diffraction**

- A. Reciprocal Lattice
- B. Ewald Sphere
- C. Intensities
- D. Structure Determination

**IV. Special Topics**

- A. Amorphous Materials
- B. Residual Stress
- C. Small Angle Scattering
- D. Reflectometry

**Grading Policy:**

There will be midterm and final 'take-home' exams worth 45% each. The final is scheduled for December 11, 9am-12pm and the final take-home will be due at that time. Homework and class participation will account for the other 10% of the total. It is expected that each student is familiar with The University's policy on scholastic dishonesty.

**Miscellany:**

The last day to drop a class with possible refund is September 10. From September 11 through September 22 a graduate student may drop a class without possible academic penalty though approval of the graduate dean is required. A graduate student may drop a course through the last class day though the instructor may assign either a Q or F for a course grade

There will be a Measurement and Evaluation Center course evaluation at the end of the semester

The University of Texas at Austin provides, upon request, appropriate academic adjustments for qualified students with disabilities. For more information contact the Office of the Dean of Students at 471-6259, 471-4241 TDD.