MS 132 Diffraction and Structure of Materials (3 3 6)
MS 130 Diffraction and Structure (3 0 6)

Lectures: TBA
MS 132 Labs: 9-12 or 1-4 M-F (TBA)
Rm 042 Keck

Instructors: B. Fultz and C. C. Ahn
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Lecture TA: TBA
Office Hours: TBA

Lab TA: TBA
Lab TA: TBA

Secretary: Pam Albertson
Room 307 or 335 Keck Laboratory for Engineering Materials

Required text:

B. Fultz and J. M. Howe, Transmission Electron Microscopy and Diffractometry of Materials Second Edition (Springer).

Recommended Books:

B. E. Warren, X-Ray Diffraction, Dover

J. M. Cowley, Diffraction Physics, North Holland

D. B. Williams and C. B. Carter, Transmission Electron Microscopy (4 Vols), Plenum

J. Edington, Practical Electron Microscopy in Materials Science (4 Vols), Philips Electronic Instruments

Other Books:

Marc De Graef, Introduction to Conventional Transmission Electron Microscopy (Cambridge, 2003).

P. B. Hirsch et al. Electron Microscopy of Thin Crystals, Krieger

M. von Heimendahl, Electron Microscopy of Materials, Academic Press

R. Heidenreich, Fundamentals of Transmission Electron Microscopy, Wiley-

Interscience.

G. Thomas and M. Goringe, Transmission Electron Microscopy of Materials, Wiley

L. Reimer, Transmission Electron Microscopy, Springer-Verlag

L. H. Schwartz and J. B. Cohen, Diffraction from Materials, (Springer-Verlag, 1987)

Content:

Jim Howe and I spent 20 years working on the course text, and we finally got it right(!) The course will indeed follow the book, generally linearly. The table of contents is online:
http://www.its.caltech.edu/~matsci/btf/TEM_Book/TOC.pdf
The preface discusses the organization of the book, and the reason for selecting the topics in the text:
http://www.its.caltech.edu/~matsci/btf/TEM_Book/preface.pdf

The coverage is approximately one chapter per week, at least until Chapter 8. This is near the end of the class, and topics will be selected from Chapters 8-11.

Grades

Students may elect to take MS 130 or MS 132 either Pass/Fail or for Grades.

MS 132 Determination of Grades:

25 % Homework

Do not look at old assignments.
Late problem sets will receive 1/3 credit, but it is okay to copy from the solution sets.
Students may collaborate on the problem solutions, and may show each other any written work.

25 % Lab Notebook

This notebook will include answers to questions in lab handouts and experimental results from completed laboratory assignments.

25% Late Midterm Exam

2 hr take-home exam.
Open book and open notes, no reference to previous exams or assignments.
Tools like a scientific calculator, ruler, and protractor may be needed.

25% Final Exam

2 hr take-home exam.
Closed book, closed notes, no reference to previous exams or assignments.
Tools like a scientific calculator, ruler, and protractor may be needed.
(There is a possibility that this exam will be replaced with a final problem set. Student preference for an exam or a problem set will be considered, but not necessarily followed.)

MS 130 Determination of Grades:

33 % Homework
33% Late Midterm Exam
34% Final Exam