

Spring 2020

MTEN 613-102: Characterization of Materials (Revised for Remote Learning)

Mirko Schoenitz

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UPDATED 3/18/2020

MTEN613, Characterization of Materials

NJIT, Spring 2020 Syllabus

Time and Location: Thursday, 6pm-9pm ---

online via Webex: <https://njit.webex.com/join/schoenitnjit.edu>

Instructor: Mirko Schoenitz,
Email: schoenit@njit.edu
Phone: office 973-596-5260, cell 609-902-3445
Course materials: canvas.njit.edu
Office hours, Mo-Fr 10am-5pm **by phone, or via Webex;** only by prior appointment

Textbook(s):

(recommended) *Materials Characterization Techniques*, Zhang, S., Li, Lin., Kumar, A., CRC Press, 2009

(also) *Materials Characterization, Introduction to Microscopic and Spectroscopic Methods*, Leng, Y., Wiley, 2013

(also) *Introduction to the Principles of Materials Evaluation*, Jiles, D.C., CRC Press, 2008

Grading: Exams (30 % each), research presentation (30 %), classroom participation (10 %)

Exams: Exams will be administered using *Canvas+Lockdown browser+Respondus*.

| Date | Topics | Assigned reading |
|--------|--|-----------------------------|
| 23-Jan | Introduction/Overview: materials structure and matter-radiation interactions | -- |
| 30-Jan | Electron Microscopy I: SEM, Microanalysis | Zhang Ch. 7, Leng Ch. 4 & 6 |
| 6-Feb | Electron Microscopy II: TEM | Leng Ch. 3 |
| 13-Feb | Probe Microscopy: STM, AFM | Zhang Ch. 4 |
| 20-Feb | Surface Analysis: XPS, AES | Zhang Ch. 3 (+Ch. 2) |
| 27-Feb | Diffraction I: XRD, Phase ID | Zhang Ch. 5 |
| 5-Mar | Diffraction II: Phase Analysis, Rietveld | TBA |
| | (research paper selection for presentation is due) | |
| 12-Mar | <i>-class canceled-</i> | |
| 26-Mar | Midterm | |
| 2-Apr | Vibrational Spectroscopy: IR, Raman | Leng Ch. 9 |
| 9-Apr | Thermal Analysis I: Fundamentals | Zhang, Ch. 10 |
| 16-Apr | Thermal Analysis II: Kinetic analysis | TBA |
| 23-Apr | Mechanical testing | TBA |
| 30-Apr | Research Presentations | |
| 14-May | Final | |