Spring 2021

MTEN 613-102: Characterization of Materials

Mirko Schoenitz

MTEN613, Characterization of Materials

NJIT, Spring 2021 Syllabus

Time and Location: Thursday, 6pm-9pm ---
online via Webex: https://njit.webex.com/meet/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;
I will be available with 24 h notice – I may be available on shorter notice.

Books:

(recommended, available electronically at NJIT library)

- *Materials Characterization, Introduction to Microscopic and Spectroscopic Methods*, Leng, Y., Wiley, 2013: https://primo.njit.edu/permalink/01NJIT_INST/dcbe8h/alma994911658605196
- *ASM Handbook Vol 10: Materials Characterization (2019 Edition)*: https://primo.njit.edu/permalink/01NJIT_INST/dcbe8h/alma992240273405196

(also useful)

Materials Characterization Techniques, Zhang, S., Li, Lin., Kumar, A., CRC Press, 2009
Introduction to the Principles of Materials Evaluation, Jiles, D.C., CRC Press, 2008

Grading: Exams (30 % each), research presentation (30 %), weekly assignment (10 %)
Exams: Exams will be administered using *Canvas+Lockdown browser+Respondus.*

Date	Topics	Assigned reading
21-Jan	Introduction/Overview: materials structure and matter-radiation interactions	--
28-Jan	Electron Microscopy I: SEM, Microanalysis	Zhang Ch. 7, Leng Ch. 4 & 6
4-Feb	Electron Microscopy II: TEM	Leng Ch. 3
11-Feb	Probe Microscopy: STM, AFM	Zhang Ch. 4
18-Feb	Surface Analysis: XPS, AES	Zhang Ch. 3 (+Ch. 2)
25-Feb	Diffraction I: XRD, Phase ID	Zhang Ch. 5
4-Mar	Diffraction II: Phase Analysis, Rietveld	TBA
	(research paper selection for presentation is due)	
11-Mar	Midterm	
25-Mar	Vibrational Spectroscopy: IR, Raman	Leng Ch. 9
1-Apr	Thermal Analysis I: Fundamentals	Zhang, Ch. 10
8-Apr	Thermal Analysis II: Kinetic analysis	TBA
15-Apr	Mechanical testing	TBA
22-Apr	Optical Microscopy	Zhang Ch. 11, Leng, Ch. 1
29-Apr	Research Presentations	
13-May	Final	

revision 2021-01-15