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Spring 2019

# MTEN 613-102: Characterization of Materials

Mirko Schoenitz

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# MTEN613, Characterization of Materials

NJIT, Spring 2019 Syllabus

**Time and Location:** Thursday, 6pm-9pm --- CKB 212

**Instructor:** Mirko Schoenitz,  
Email: schoenit@njit.edu  
Phone: office 973-596-5260, cell 609-902-3445  
Course materials: <http://moodle.njit.edu>  
Office hours, Mo-Fr 10am-5pm 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 %)

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