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Spring 2020

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

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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	