

## MATERIALS SCIENCE AND ENGINEERING (0750)

### Teaching Schedule 2019-2020

<u>Course No.</u>	<u>Title</u>	<u>Fall</u>	<u>Winter</u>	<u>Spring</u>
GT 106	Freshman Design and Communications			
298/398	IDEA			
101	Modern Materials			
190	MS&E Freshman Projects	TTh 2:00 Dravid		
201	Principles of the Properties of Materials	TTh 9:30 Emery/Wolverton	MWF 10:00 Chung/Olvera	TTh 9:30 Emery/Huang
301	Chemical Aspects of Engineering Materials	MWF 12:00 Emery/Wolverton		TTh 9:30 Emery/Huang
314	Thermodynamics of Materials	MTWF 3:00 Barnett		
315	Phase Equilibria and Diffusion in Materials		MTWF 2:00 Wolverton/Emery	
316-1	Microstructural Dynamics			MTWF 1:00 Joester
316-2	Microstructural Dynamics	MWThF 1:00 Joester		
318	Materials Selection		MWF 11:00 Carr	MWF 3:00 Carr
331	Soft materials			MWF 12:00 Huang
332	Mechanical Behavior of Solids		MWF 1:00 Shull	
333	Composites			
336	Chemical Synthesis of Materials			
337	Conducting Polymers		MWF 10:00 Huang	
340	Ceramic Processing			MWF 12:00 Barnett
341	Intro to Modern Ceramics			
351-1	Intro Physics of Materials	MWF 10:00 Snyder		
351-2	Intro Physics of Materials			
353	Bioelectronics			TTh 9:30 Rogers
354	Bioelectronics Lab			
355	Electronic Materials			
357	Nanomagnetic Materials for Information Storage			

358	Electronic and Thermal Properties of Materials				MWF 3:00 Snyder
360	Electron Microscopy				TTh 12:30 L. Marks
361	Crystallography & Diffraction			MWF 12:00 Bedzyk	
362	Point, Line & Planar Imperfections				
370	BioMaterials				
371	Biomaterials: Hierarchical Architecture and Function			TTh 12:30 Joester	
376	Nanomaterials				
380	Intro to Surface Science & Spectroscopy				
381	Materials for Energy-Efficient Technology		TTh 11:00 Dunand		
382	Fuel Cells				
385	Electronic and Thermal Properties of Materials				MWF 3:00 Snyder
390	Materials Design				MWF 11:00 Shull
391	Process Design		MWF 3:00 Chung		
394	Honors Project		TBA	TBA	TBA
395	Magnetic Properties of Materials				
395	Mechanical Modeling				
395	Special Topics: Engineering Strategies in Tissue Engineering & Regenerative Medicine				
395	Special Topics: Materiality in Art and Architecture				
395	Special Topics: Organic Materials				
395	Special Topics		MWF 12:00 Rondinelli		
395	Special Topics				
395	Special Topics				Rogers
396	Senior Project MS&E		W 2:00 Stair	W 2:00 Stair	W 2:00 Stair
398	Introduction to Plasma Sci. and Processing Tech.				
399	Special Projects MS&E		TBA	TBA	TBA

401	Chemical and Statistical Thermodynamics of Materials		MWThF 10:00 Luijten/Lauhon		
402	Structure of Crystalline and Noncrystalline Materials		TTh 11:00, F 11:00 Rondinelli		
404	Imperfections in Materials			MWF 2:00 Seidman/Haile	
405	Physics of Solids				MTWF 1:00 Hersam
406	Symmetry and Mechanical Properties of Materials				MWF 2:00 Dunand/Emery
408	Phase Transformations in Materials			MWF 3:00 Voorhees	
411	Phase Transformations in Crystalline Materials				MW 4:00 Voorhees
415	Fundamentals of Thin Film Materials				
416	Kinetics				TTh 2:00 Seidman
434	Fracture of Brittle Solids				
435	High Temperature Materials			TTh 10:00 Dunand	
444	Organic Nanomaterials		TTh 5:00 Gianneschi		
445	High Polymer Science		MW 4:00 Olvera		
451	Physics of Materials		MTWF 1:00 Hersam		
452	Special Topics in Solid State Physics of Materials: Optoelectronic Materials				TTh 9:30 Rondinelli
455	Physics of Nanostructures				
456	Functional Metamaterials				
458	Computational Materials Science			MWF 9:00 Wolverton	
460	Electron Microscopy			TTh 2:00 (MatSci only) L. Marks	
461	Diffraction Methods in Materials Science				

465	Advanced Electron Microscopy and Diffraction		TTh 9:30 Marks	L.	
466	Analytical Electron Microscopy				TTh 11:00 Dravid
485	Electronic and Thermal Properties of Materials				MWF 3:00 Snyder
495	Materials Biology				
495	Solar Energy Conversion			MW 11:00 Chang	
495	Mechanics of the Cell				
495	Mechanics of Soft Matter				
495	Solid State Electrochemistry for Energy Storage and Conversion				MW 9:30 Haile
498	Statistical Mechanics				
499	Projects		TBA	TBA	TBA
510	Special Topics Computational				
590	Research		TBA	TBA	TBA

Some Non-MSE Courses of Interest (not an exhaustive list)

<b>CIV_ENV 430</b>	Cohesive Fracture and Scaling				MWF 4:00-5:50 Bazant
<b>CIV_ENV 415</b>	Theory of Elasticity				Brinson
<b>ES_APPM 311-1</b>	Methods in Applied Math	20	MWF 12:00 Olmstead		
<b>ES_APPM 311-1</b>	Methods in Applied Math	21	MWF 11:00 Olmstead		
<b>ES_APPM 495</b>	Modeling of Soft Materials				
<b>ES_APPM 495</b>	Intro to Statistical Mechanics				
<b>Chem 360</b>	Nanopatterning				TTH 1:00 Odom
<b>Chem 407</b>	Materials and Nanochemistry		Tu-Th 11:00-12:20 Schaller		
<b>Chem_Eng 361</b>	Introduction to Polymers		MTWF 10:00 Torkelson		
<b>Chem_Eng 451</b>	Applied Molecular Modeling				
<b>Chem_Eng 462</b>	Viscoelasticity and Flow in Polymer Systems				
<b>Chem_Eng 475</b>	Cell-Material Interactions				MW 4:00-5:30 Shea
<b>Chem_Eng 478</b>	Advances in Biotechnology				W 12-2, F 1-2 Shea
<b>BME 343</b>	Biomaterials and Medical Devices				

<b>ME 445</b>	Micromanufacturing		TuTh 9:30-11 Cao		
<b>ME 456</b>	Mechanics of Advanced Materials				
<b>ME 495</b>	Nanoengineered Materials for Mecanobiology				
<b>ME 495</b>	Nuvention: Medical Innovation		TBA 6:00-9:00 PM Marasco	<b>Note:</b> Interested students can contact Kevin Henderson (current MSE grad student) for advice	
<b>ME 381</b>	Intro to Micro-electro- mechanical systems		MWF 11:00 Espinosa		
<b>ME 382</b>	Experiments in Micro- and nano-science and Engineering				TuTh 12:30-1:50 Espinosa

requirement for Ph.D. Program

satisfies 400-level (graduate) MSE requirement