College of Engineering

School of Mechanical, Industrial and Manufacturing Engineering

MATERIALS SCIENCE MINOR

The Materials Science Minor involves the study of the structure and properties of natural and man-made materials and has course offerings spanning disciplines in engineering, science, and forestry at OSU. The minor may be tailored to students with interest in a wide range of materials including composites, ceramics, polymers, metallurgy, electronic materials and devices, solid-state chemistry, and solid-state physics.

Required		**Credits**
Core:		
MATS 321	Introduction to Materials Science	4
MATS 322	Mechanical Properties of Materials	4
*MATS 413	Thermodynamics & Phase Equilibria of Materials	4
Elective Coursework		15
		27

***CHE 311+CHE 312 can be substituted for MATS 413**

****List of Elective Coursework on the following page**

300 and 400-level MATS, ME and MFGE courses count as Technical Electives for Mechanical Engineering students. ***(Confirm, based on catalog requirements, if 3 or 4 credit tech electives are required.)***

Please, see a MIME Advisor for more information.

For more information visit
https://catalog.oregonstate.edu/college-departments/engineering/school-mechanical-industrial-manufacturing-engineering/materials-science-minor/

College of Engineering

School of Mechanical, Industrial and Manufacturing Engineering

MATERIALS SCIENCE MINOR ELECTIVE COURSEWORK

Course	Course Name	Credits	Prerequisites	SU	F	W	SP
CCE 422	Green Building Materials	3	CCE 321, ECON 201/2, ST 314		Ecampus		
CH 411	Inorganic Chemistry	3	1 year of chemistry			Ecampus	
CH 412	Inorganic Chemistry	3	CH 411				
CH 440	Physical Chemistry	3	MTH 254 or MTH 254H			Ecampus	
CH 441	Physical Chemistry II	3	CH 440 or CHE 311, MTH 254, MTH 254H				Ecampus
CH 442	Physical Chemistry III	3	CH 441, MTH 254, MTH 254H	Ecampus			
CHE 444	Thin Film Materials Processing	4	CHE 443				
CHE 445	Polymer Science and Engineering	4	CH 334, 335, 336, MTH 256				
CHE 450	Conventional and Alternative Energy Systems	3	CHE 311 or ME 311 or NSE 311 or CH 440				
CHE 451	Solar Energy Technologies	3	CHE 311 or ME 311 or NSE 311 or CH 440				
ECE 416	Electronic Materials and Devices	4	ENGR 201, PH 213, CH 201 or CH 121 & 122 or CH 231 and CH 261				
ECE 418/518	Semiconductor Processing	4	ECE 416				
MATS 441	Physical Metallurgy	3	MATS 321				
MATS 445	Welding Metallurgy	4	MATS 321				
MATS 478	Thin Film Materials Characterization and Properties	4	ME 311 or NSE 311, MATS 321, 322				
ME 480/580	Materials Selection	3	MATS 321				
ME 483	Mechanics of Composite Materials	4	ME 316				
ME 484	Fracture of Materials	3	MATS 322				
MFGE 438	Composites Manufacturing	4	ENGR 213				
NSE 445	Materials for Nuclear Energy Systems	3	MATS 321				
NSE 446	Nuclear Materials Characterization & Qualification	4	MATS 321				
NSE 499/599	Special Topics: Radiation Damage in Metals	3	None				
WSE 321	Wood Chemistry/Chemistry of Renewable Materials	3	CH 122 or 202 or 232 or 232H				
WSE 322	Physical & Mechanical Properties of Renewable Materials	4	None				
WSE 324	Renewable Materials Laboratory	3	WSE 321, 322				

Alternate Electives for Mat Sci Minor + AMP students (16 cr):

- CH 616. Crystallography and X-Ray Diffraction (4), *Recommended Preq: At least one upper-level undergraduate inorganic chemistry course*
- CHE 545. Polymer Engineering and Science (4), *Recommended Preq: CH 334, CH 335, CH 336 and MTH 256*
- CHE 546. Polymer Synthesis and Processing (3), *Recommended Preq: 3 credit hours of undergraduate organic chemistry course or CH 331 or CH 334*
- ECE 518. Semiconductor Processing (4), *Recommended Preq: ECE 416*
- MATS 545 Welding Metallurgy (4), *Preq: MATS 321 or MATS 570*
- MATS 555 Experimental Techniques in Materials Science (4), *Preq: MATS 321*
- MATS 570 Structure-property relations in materials (4), *Recommended Preq: MATS 321*
- MATS 571 Electronic Properties of Materials (4), *Recommended Preq: MATS 570 or CH 545*
- MATS 581. Thermodynamics of Solids (4), *Recommended Preq: MATS 413*
- MATS 582. Rate Processes in Materials (3), *Preq: MATS 581*
- MATS 584 Advanced Fracture of Materials (4), *Recommended Preq: MATS 322*
- MATS 588. Computational Methods in Materials Science (4), *Recommended Preq: MATS 321 and Matlab or Mathematica experience*
- ME 580 Materials Selection (3), *Preq: MATS 322*
- MATS 578. Thin Film Materials Characterization and Properties (4), *Recommended Preq: MATS 570*
- MFGE 538 Composites manufacturing (4), *Recommended Preq: ENGR 213*
- MFGE 551 Additive manufacturing (3), *Preq: Graduate standing or instructor override*
- NSE 545 Materials for Power Systems (3), *Preq: MATS 570*
- NSE 546 Characterization & Qualification of Materials for Extreme Environments (4), *Recommended Preq: MATS 321*
- OC 528. Microprobe Analysis (3), *Recommended Preq: MATS 570*