Materials Minor

Montana State University, Bozeman, offers a non-teaching minor in Materials Science & Engineering called the Minor in Materials. This minor provides courses from a variety of disciplines which are relevant to synergies of science and engineering in polymer, metallic, ceramic, hybrid, and composite materials for both structural and functional application. The minor requires a minimum of 32 credits comprised of 14 credits of required coursework (or equivalent) followed by 18 credits of elective coursework. EMAT 350 Engineering Materials is the cornerstone, foundational course for the Minor in Materials and is a required core class.
Students seeking the Minor in Materials must satisfy the core and additional course requirements, 32 credits total, as outlined below:

Required Pre-requisite Courses		
(credits not counted towards minor):		
M 171Q	Calculus I	
M 172	Calculus II	
PHSX 220	Physics I with Calculus	
PHSX 222	Physics II with Calculus	
CHMY 141	College Chemistry I	
Required Courses		
(or equivalent courses as approved by the certifying officer):		
EMEC 250	Mechanical Engineering Materials	3
EMAT 252	Materials Struct and Prop Lab	1
EMAT 350	Engineering Materials	3
EMEC 320	Thermodynamics I	3
ETME 215	Manufacturing Processes	3
ETME 216	Manufacturing Process Laboratory	1
These pre-requisite courses and required courses represent the core fundamentals of materials science and engineering which are applicable to students in the College of Engineering in addition to Physics and Chemistry. Students pursuing a BS in Engineering or the Physical Sciences will have to take 18 additional course credits (6 courses) out of the list below to obtain a Minor in Materials which may also serve as electives in the student's major. Other courses may also be approved by the certifying officer with a written request detailing the merit of the course.		
Additional Courses		
Choose six from the following:		18
CHMY 371	Physical Chemistry-Quantum Chemistry and Spectroscopy I	
CHMY 373	Physical Chemistry - Kinetics and Thermodynamics	
CHMY 401	Advanced Inorganic Chemistry	
ECHM 405	Sustainable Energy	
ECHM 424	Transport Analysis	
ECHM 452	Advanced Engineering Materials	
EMAT 460	Polymeric Materials	
EMAT 461	Friction and Wear of Materials	
EMAT 462	Manufacturing of Composites	
EMAT 463	Composite Materials	
EMAT 464	Biomedical Materials Engineering	
EMAT 550	Failure of Materials	
EMAT 552	Advanced Ceramics	
EMAT 553	Advanced Composite Materials	
EMEC 444	Mech Behavior of Materials	
EMEC 465	Bio-inspired Engineering	
EMEC 467	Micro-Electromechanical Systems	
EMEC 565	Smart Structures	
PHSX 441	Solid State Physics *	
Total Credits		**32**

* Course pre-requisities not included in the lists above do not count towards the 18 credits.