Description of Course Offering for an Undergraduate Minor in Explosive Processing of Materials at the Colorado School of Mines

A total of 18 credit hours are needed to complete the Explosive Processing of Materials Minor Program. This is the preferred route for students that would like to apply explosive engineering to the joining and forming of materials. The first three (required) courses will provide the students with basic knowledge in explosive engineering and materials. The subsequent nine-credit hours will focus on the microstructural and property development in materials (as a function of deformation rate) and on forming and joining of materials. Even though many of the courses do not specifically mention the word "explosive" in their titles, the effect of explosive processing will be addressed under the effect of deformation rate. Explosive joining, forming, and compaction occur at high deformation rates of 10^4 s^{-1} or greater. This minor program requires a three (3) credit hour independent hands-on research project. Students will be counseled regarding their course sequencing to meet the prerequisites for the courses.

Course Number	Title	Credit Hours
Required of All Students		
MNGN 333	Introduction to Explosive Engineering I	3
SYGN 202	Introduction of Engineering Materials Systems	3
MTGN 499	Independent Studies (Hands-on Explosive Research Related))	3
Select at least three Courses from the following:		
MTGN 348	Microstructural Development in Materials	4
MTGN 390/EGGN390	Materials and Manufacturing Processes	3
MTGN 442	Engineering Alloys	3
MTGN 455	Mechanical Behavior of Materials	4
MTGN 456-458	Electron Microscopy and Laboratory	2-1
MTGN 464	Forging and Forming	3
MTGN 475-477	Introductory Welding Metallurgy	2-1
	Total	**18**