The new interdisciplinary graduate program is focused in Materials Science research with respect to energetic (explosive) materials. The Materials Science Program at the Colorado School of Mines administers this graduate level program for those students wanting to pursue an advanced degree in materials science with emphasis in energetic materials.

**DOCTOR OF PHILOSOPHY DEGREE** – 72 credit hours

- 9 credit hours: Materials Science core courses.
- 24 credit hours: Track-interest course within the Materials Science program or a participating department.
- 48 credit hours of dissertation research.
- Written qualifying exam
- Dissertation proposal.
- Dissertation defense.

**MASTER OF SCIENCE DEGREE, THESIS-BASED** – 30 credits hours

- 9 credit hours: Materials Science core courses.
- 9 credit hours: Track-interest course within the Materials Science program or a participating department.
- 12 credit hours of research.
- Thesis defense.

**MASTER OF SCIENCE DEGREE, NON-THESIS** – 30 credits hours

- 9 credit hours: Materials Science core courses.
- 15 credit hours: Track-interest course within the Materials Science program or a participating department.
- 6 credit hours of case study.
**Core Curriculum:**

- MLGN 591 - 3.0 hours 
  MATERIALS THERMODYNAMICS
- MLGN 592 - 3.0 hours 
  ADVANCED MATERIALS KINETICS AND TRANSPORT
- MLGN 593 - 3.0 hour 
  BONDING, STRUCTURE, AND CRYSTALLOGRAPHY

**Track-Interest Courses:**

**Required**

- MNGN 444 - 3.0 hour Explosives Engineering II
- MNGN 598 - 3.0 hour Advanced Explosives Engineering
- MNGN 698 - 3.0 hour Special Uses of Explosives

**Free Electives**

- MEGN 553 - 3.0 hour Introduction to Computational Techniques for Fluid Dynamics and Transport Phenomena
- MTGN 545/445 - 3.0 hour Mechanical Properties of Materials
- MTGN 599 - 1.0 hour Special seminar topic (e.g. High Strain Rate Deformation, Chemistry of Explosives, Shock wave physics, high-velocity impact, etc)
- MTGN 545/445 - 3.0 hour Electron Microscopy

**Dissertation Research:**

Student must prepare and submit a Ph.D. Thesis to his/her advisory committee for approval in accordance with the general requirements of graduate school. The research work may be conducted outside the university campus.

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**General Program Information**

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**Explosive Materials Science & Engineering Program Information**

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