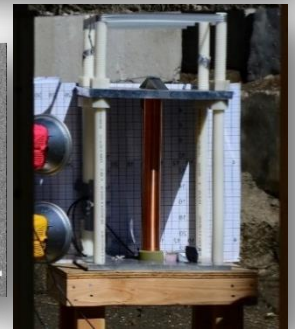
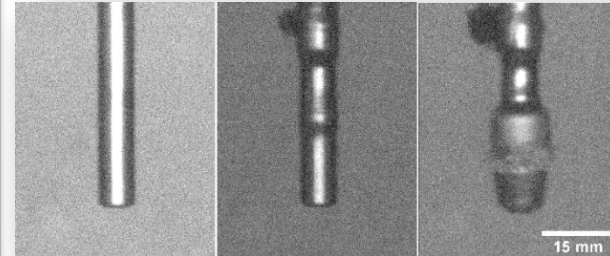
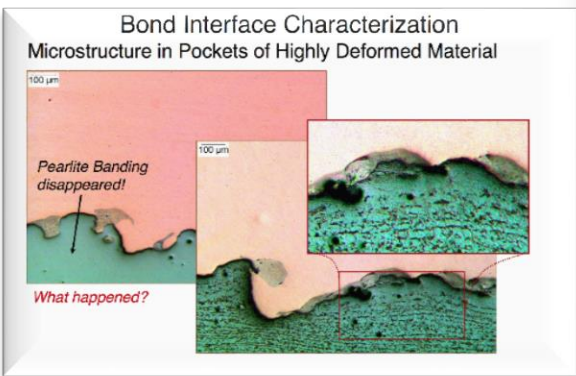
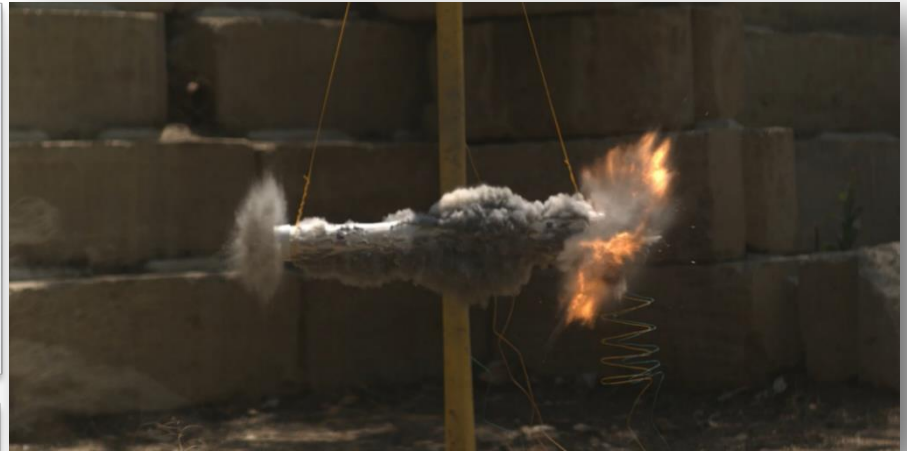
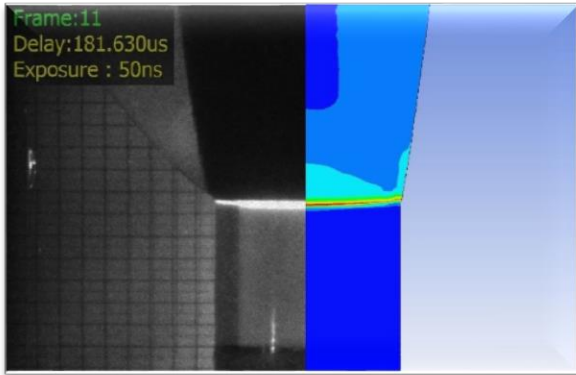


Explosive Materials Science & Engineering

Degree Programs M.S. and Ph.D.



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 credits hours: Materials Science core courses.
- 24 credits 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

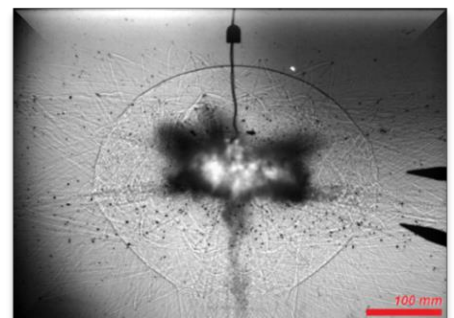
- 9 credits hours: Materials Science core courses.
- 9 credits hours: Track-interest course within the Materials Science program or a participating department.
- 12 credit hours of research.
- Thesis defense.

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

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



MNGN 333 students at the Explosive Research Laboratory (ERL) at Idaho Springs, Colorado.



Shadowgraph frames from a #8 electric detonator at the Small Scale Blast Chamber in Golden, Colorado.

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
Experimental Methods
and Instrumentation for
Explosives Engineering

MNGN 598 -3.0 hour
Advanced Explosives
Engineering

MNGN 698 -3.0 hour
Special Uses of
Explosives

Free Electives

MEGN553 -3 .0 hour
Introduction to Computational
Techniques for Fluid Dynamics and
Transport Phenomena

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
Mechanical Properties of Materials

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.

General Program Information

Dr. Ryan O'Hayre
Director of Materials Science Program
Email: rohayre@mines.edu
Phone: 303-273-3952
Address: 1500 Illinois St. Golden, CO 80401

Explosive Materials Science &

Engineering Program Information

Dr. Vilem Petr
Research Professor and Director of AXPRO
Email: vpetr@mines.edu
Phone: 303-273-3222
Address: 1600 Illinois St. Golden, CO 80401