Non-Destructive Materials Assessment Focus Area

Mentor: David Olson x3955

Materials Science Requirements

Required Six Materials Science Core Classes*

MLGN500 Processing, Microstructure, and Properties of Materials
MLGN512/MTGN412 Ceramic Engineering
MLGN531/CHGN416 Polymer Engineering and Technology
MLGN501/CHGN580 Structure of Materials or CHGN505 Adv Organic Chemistry
MLGN504/MTGN555 Solid State Thermodynamics
or CHEN509 Advanced Chemical Engineering Thermodynamics
MLGN511 Kinetic Concerns in Materials Processing or MTGN548 Transformation in Metals
or MTGN556 Transport in Solids or CHEN518 Reaction Kinetics & Catalysis
or CHGN585 Chemical Kinetics

*Transfer credit can be approved signature of the advisor and the Lead Scientist.

Focus Area Requirements

Math Requirement: PHGN311 Intro to Mathematical Physics or
Math 348 Adv. Engineering Mathematics

Focus Area Prerequisites Met?

Yes

No

Modern Physics: PH320 (II)
Circuits: EGGN382 or PHGN215

Choose 5 courses from the list below with the help of your advisor.

MTGN542 – Alloy Theory
MTGN583 – Principles of NDT
MTGN598 – E&M Property Assessment
MTGN598 – Elastoacoustic Wave Analysis
MTGN456 - Electron Microscopy
MLGN502/PHGN440 - Solid State Physics
MLGN505 - Mechanical Properties of Materials
PHGN361 – Intermediate E&M
MLGN506/MTGN556 - Transport in Solids
MLGN517 - Solid Mechanics of Materials
MTGN560 – Analysis of Metallurgical Failures
MTGN598 – Defects in Solids
MTGN541 – Introductory to Physics of Metals
MTGN381 - Phase Equilibria

A minimum of 18 course credits (6 courses) are required for students with course transfer/waivers. Total course credits: 30.

Oral PhD Qualifying Examination The qualifying exam is a 2 hr oral exam. The PhD candidate, in collaboration with their advisor and the ND materials assessment track mentor, will organize a qualifying examination committee of 3-5 professors and schedule the exam. A minimum of 10 days prior to the exam, the candidate must submit an extended abstract describing his/her PhD research plans and preliminary results. This abstract should also discuss the major fundamental materials science themes of their research as they relate to the six ML core courses. During the exam, the candidate will deliver a 30 min oral presentation on their research plans/preliminary results, followed by up to 90 minutes of oral examination from the committee on the specifics of their proposed research as well as more general fundamental materials science and engineering questions appropriate to the candidate's research area and the core materials science courses.

PhD Thesis Defense