

Doctor of Philosophy (Philosophiae Doctor, PhD) in Materials Science & Engineering

For a PhD the student must:

- (i) Have a research advisor who is a member of the MSE program's Graduate Faculty
- (ii) Have a research project relevant to the MSE graduate program
- (iii) Take a total of 36 research credits
- (iv) Take a total of 36 taught credits
- (v) Pass a PhD qualifying exam on the core courses after year one
- (vi) Write and present a PhD thesis proposal (usually at the end of the second year)
- (vii) Write a PhD thesis and defend their research in front of peers and a thesis committee

The PhD takes 4 to 5 years with a combination of taught and research credits being taken each year.

Example First Year

Core courses (most students will take these):

635:527 Thermodynamics of Materials Systems (3 credits)

635:513 Mechanical Behavior of Materials (3 credits)

635:503 Theory of Solid State Materials (3 credits)

635:532 Kinetics of Materials Systems (3 credits)

Elective courses (students typically take 2 or 3 of these):

635:505 Advanced Optical Materials (3 credits)

635:525 Properties of Materials Surfaces (3 credits)

635:529 Applied Colloid and Surface Chemistry (3 credits)

635:566 Electron Microscopy (3 credits)

635:567 Electron Microscopy Lab (1 credit)

635:601 Materials Seminar (1 credit)*

635:701 Research in Materials (1 to 6 credits)

635:506 Advanced Glass (3 credits)

635:509 Advanced Electroceramics (3 credits)

635:516 Molecular Behavior of Glasses (3 credits)

635:524 Advanced Materials Characterization (3 credits)

635:528 Modern Electrochemistry (3 credits)

635:602 Materials Seminar (1 credit)*

635:702 Research in Materials (1 to 3 credits)

Second and Subsequent Years

Students take approximately 9 credits per semester of electives to get to a total of 36 taught credits plus 635:701 and 635:702 "Research in Materials" to reach their total of 36 research credits.

Credits outside MSE graduate Program (see note)**

You are permitted to take a small number of courses for credit outside of our graduate program, for instance:

Graduate courses offered by other programs at Rutgers – always check with course lecturer first (BME, CBE, MAE, ECE, Physics, Chemistry);

MSE advanced undergraduate courses – always check with course lecturer first (examples are 14:635:433 Optical Materials, 14:635:312 Glass Engineering,...others);

Transferred credits from other institutions – check with graduate program director (typically from prior graduate level study).

***Note: For PhD students materials seminar can count for a maximum of 6 credits**

****Note: Maximum allowed is 15 credits for PhD**