

New Student Orientation 2016

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PhD Program Overview

What needs to happen here to ensure your success after you graduate?

PhD Program Overview

- **Coursework + Colloquia:** foundation, to which you will add new knowledge.
- **Research:** skills you need to identify important challenges, define scientific problems, seek solutions.
- **Everything else:**
 - Teaching
 - Professional conduct (ethics, safety)
 - Communication with scientists and others
 - Working in teams, contributing to non-scientific goals
 - Networking, self-promotion

Coursework (Y1, Y2)

- Typically 3 per quarter
- **Core courses:** 5 required, all in Year 1
- **Elective courses:**
 - 4 400-level courses, at least 3 of which are MatSci 4XX.
 - 2 related courses for “minor” + 4 other grad courses
 - Have an M.S.? Credit for up to 6 courses.
 - Advising info on Monday and Tuesday
- **Preliminary Exam** (Due June 3 of Y1, March for MS)
 - Core GPA > 3.2
 - Research performance assessed by adviser and faculty

Course & Research Evaluations

- **Preliminary Exam (June of Y1, March for MS)**
 - Core GPA > 3.2
 - Research performance
- **Qualifying Exam (Fall Y3, Y2 for MS)**
 - Thesis proposal defense (admission to candidacy)
 - Evaluation of core knowledge and its application
 - Evaluation of research promise based on first two years of research

Research Evaluations

- **Annual check-in following qualifier**
 - Is student making reasonable progress towards the PhD degree?
- **Thesis Defense**
 - Significant advance in an area of MSE: how has the field been changed? What new opportunities have been defined?
 - Typically a few first author publications.

PhD Program Overview

- **Coursework + Colloquia:** foundation, to which you will add new knowledge.
- **Research:** skills you need to define and solve scientific problems.
- **Everything else:**
 - Teaching
 - Professional conduct (ethics, safety)
 - Communication with scientists and others
 - Working in teams, contributing to non-scientific goals
 - Networking, self-promotion

TA Requirement

- Essential part of doctoral training
- 2-3 courses (depends on time commitment)
- Commitment level varies, as does the nature of the work.
- Additional pay and opportunities for those who desire more teaching experience
- There are resources for TA training

Fall, 2016 TA Opportunity

Northwestern University: MSE Core Curriculum						
(Click on the Individual Links below to Access the Corresponding Content)						
301 (Mat. Sci. Principles)	text	catalog desc. and outcomes		labs		
314 (Thermo.)	text	catalog desc. and outcomes	problems		computation	
315 (Appl. of Thermo., Diff.)	text	catalog desc. and outcomes	problems	labs		
316-1 (Line and Planar Defects)	text	catalog desc. and outcomes	problems	labs	computation	Syllabus
316-2 (Phase Transitions)	text	catalog desc. and outcomes	problems	labs		
332 (Mechanical	text	catalog desc. and outcomes	problems	labs	computation	Syllabus

<http://msecore.northwestern.edu/>

Example Text

Eq. 3.11 is plotted in Figure 3.2 for three different time points.

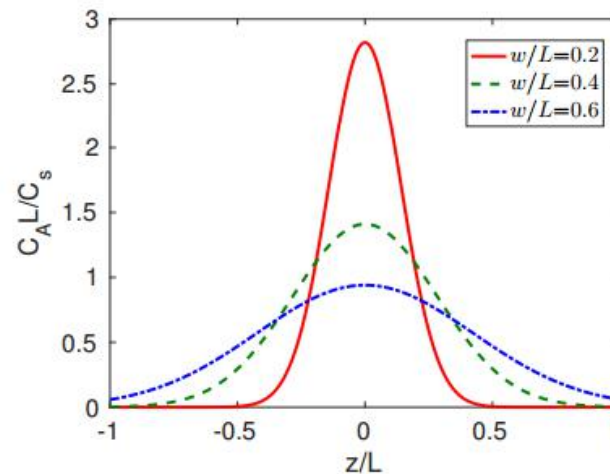


Figure 3.2: Representations of Eq. 3.8 for different values of the diffusion length, ℓ_A^D .

In many cases all we need to know is the diffusion length, ℓ_A^D , in order to understand what is going on at a pretty high level of detail. For example, ℓ_A^D describes both the width of interfacial mixing for two materials that are brought into contact with one another (Figure 3.1) and the diffusive broadening of a thin interfacial layer (Figure 3.2). The quantitative interpretation of the diffusion length in these two circumstances is illustrated in Figure 3.3. In Figure 3.3a we plot the interfacial broadening for a thin layer that is diffusing in the positive and negative z directions. The width of the diffusion profile can be characterized by the half-width of the peak, w' , evaluated at half the total peak height. In Figure 3.3b we plot the concentration

Responsible Conduct in Research: Training and Resources

- Safety first (Tues, in research groups)
- Ethical conduct in research and coursework
 - CITI Training: DUE BY OCT 19
 - Gen Eng 519
- **Register for Gen Eng 519 within first year.**

Managing Conflict

- Conflicts of interest are impossible to avoid completely.
- Not all conflicts are "bad".
- Learning to manage conflict is part of your professional development.

What should you do if you are not comfortable with an incident or situation?

Student Support & Conflict Management

- Do not wait to raise concerns.
- Make use of University counseling resources.
- Bridget Sweeney Marino and Kathleen Stair serve as non-faculty points of contact (confidential).
 - Is my concern concerning?
 - What is the best path to resolution?
- The Chair (Luijten) and Director of Graduate Studies (Shull) can be contacted at any time.

<http://www.tgs.northwestern.edu/graduate-life/dealing-with-conflict/index.html>

Mental Health and Well-Being

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You should let your friends and advisor know when...

- You have not "felt like yourself" for some time.
- You are having difficulty focusing on work or making progress.
- Your feelings about coursework and/or research are mostly negative.

Adviser Selection Process

- **Orientation Week:**
 - Faculty research presentations
 - Poster session (Thursday)
- **September 19- October 17 (4 weeks)**
 - Read papers, meet with faculty individually
 - Talk with graduate students
 - Submit straw poll October 12
- **October 19: turn in selection form (with CITI completion certificate)**

Selection Process: Round 2

- **October 21-November 7:**
 - 2nd placement round research
- **November 7:** turn in updated advisor preferences

To Do

- CITI on-line course
- Register for Gen Eng 519
- Office of Fellowships/TGS Info
 - <http://www.tgs.northwestern.edu/funding/fellowships-and-grants/index.html>
 - NSF GRFP deadline for US Citizens

Questions?

- Coursework
- Research
- Practical

