Graduate Education
Thesis & Dissertation Writing Workshop

Spring 2018
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Part I: Guidance on writing your thesis or dissertation
The Office of Graduate Education

C 2201

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  - Dean of Graduate Education

- Rachel Howard
  - Admissions, applications, assistantships

- Trudy Severson
  - Student progress, POS processing, degree audits, thesis/dissertation processing
What is a research degree?

• READ journals to find a question* that hasn’t been answered or a problem that hasn’t been solved yet
• DEFINE a question and methods to answer it
• DO the research
• WRITE up the answer
• DEFEND it publically
• PUBLISH it
Who is responsible?

YOU

• However, many others can and will help:
  • Your Advisor/Major Professor
  • Your Program’s Graduate Coordinator
  • Your Committee
  • Your Department
  • The Office of Graduate Education (Rachel and Trudy are extraordinarily helpful and knowledgeable.)

• Placing the onus, and “ownership” on you is very much to your benefit—the product is YOURS

• Outstanding training for workplace projects
The process

Where to start, how to proceed
Steps
Where do I start?

• Define a topic area and establish committee
• Review the literature
• Develop and refine research question
• Develop and refine methods
• Collect and analyze data
• Write up the results
• Get approval of document from advisor
• Get approval from committee
• Defend
• Final edits

Process is not as linear as it appears!
Define a topic area
Many ways to start

• What do you want to be an expert in?
• What skills or knowledge do you want to gain?
• What professional areas interest you?
• What do you think will help you find a job?
• What can your advisor give you funding for?

Ideally, the topic excites and interest you. You will be spending a lot of time on it—it helps if it enjoyable.
Establish a Graduate Committee

• Purpose: to guide the student’s academic coursework selection and research activities

• Master’s committee
  • Major professor (has at least a master’s degree)
  • Graduate Division Representative
  • At least one additional member

• Dissertation committee
  • Major professor (must have a PhD)
  • Graduate Division Representative
  • At least three additional members
Who can be on a committee?

• Major professors and Grad Div Reps must be full-time Mines faculty.

• Grad Division Rep must be from a different department/program*

• All committee members must have a minimum of a BS degree.

• Better not to overload committee
  • More members = harder scheduling

* Not on faculty list for interdisciplinary programs
Off-campus committee members

Considerations

• At least 3 members must be full-time Mines faculty
• Larger committees must have a majority of Mines full-time faculty
• Students should defend 1-2 weeks earlier to allow time for signatures to be mailed
Role of the major professor

• Guide student’s coursework
• Assist student in choosing a committee
• Assist student in developing research problem
• Guide student’s research
• Review the thesis/dissertation content and format for adherence to Grad Ed requirements
• Chair the committee for exams/defense; manage committee disagreements
• Mentor student’s development as a research professional
Role of the Graduate Division Rep

• Represent the broad concerns of the Office of Graduate Education and the University with respect to high standards of graduate education and scholarly performance,

• Assure that all procedures are carried out fairly and according to the guidelines of the Office of Graduate Education,

• Participate in conducting final examinations and provide an outcome report to the Office of Graduate Education immediately following the final exam,

• Assist in the resolution of committee disputes.
Role of the committee members

• To assist the major professor and Grad Div Rep in guiding and evaluating the student
• To attend and evaluate student performance on exams and the defense
• To provide additional expertise to the research, if appropriate
• To review the quality of the work performed
• To verify that the final thesis/dissertation is an acceptable document in term of technical quality and written English
Review the literature

Everything you can get your hands on

• Learn to use search engines to find journal articles, and the library to get them
• Get a bibliography program such as EndNote
• Read, read, read, every week
• Critically review each paper
  • What was established? What questions were answered?
  • What new questions arose? What is the next step? Could you do that next step?
• Develop a way to organize what you learn
• Start writing—the lit review is Chapter 1.
Refine your question
Is it focused? Is it answerable?

• Use your reading and advisor’s guidance to develop a research question or hypothesis
• Compare these proposed research problems:
  
  Physiological impacts on intellectual capacity
  
  The effects of caffeine on student performance
  
  College students obtain higher test scores when consuming caffeine before exams.
Is your question a hypothesis?
Or can it be stated as such?

• A good hypothesis
  • Is a statement that can be proved or disproved
  • Defines a question in concrete, definitive terms
  • Defines the scope of the problem
  • Maybe a portion of a larger problem
  • Suggests the next steps
Develop and refine methods

Think before you collect

• What data are needed?
  • Preliminary versus primary

• How will it be gathered?
  • Consult literature for standard practices
  • Determine if new practices will be tested?

• How will it be analyzed?
  • What statistical or analytical techniques are needed? The design must support the analysis.

• What problems might arise? How can the risks be mitigated?

• What results are anticipated?
WRITE your methods
Before you start collecting

• This is Chapter 2!

• Write the chapter while defining methods
  • The writing process itself helps clarify thoughts
  • You will better anticipate problems
  • Less likely to fail to collect important data

• Include data analysis methods
  • Visualize statistics or figures needed to prove or disprove the hypothesis

• Consult your statistician beforehand
The Proposal
It is to your benefit to complete it as soon as possible

• Required for PhD students as part of the comprehensive exam
  • Reviews the literature
  • Establishes the research question/hypothesis
  • Defines the methods
  • Shows preliminary data, if any
  • Poses alternatives in case of “unexpected” challenges and outcomes
  • Establishes objectives and deliverables that indicate completion of the project (in essence, the contract between you and your committee).

Recommended for MS students too—discuss with your major professor
Collect and analyze data

• Meet regularly with major professor to discuss results and plan revisions, if needed
• Be precise and methodical
• Keep excellent notes—on everything
  • Pictures, drawings, figures, files
  • Experimental details, dates, equipment
  • Data, “good or “bad”, ALL of it
  • Lab books are more reliable than computer files
  • BACK UP all data and notes weekly
• If ethical, legal, or ownership issues arise, these records could be needed to defend your work.
Get approvals

- Consult major professor and committee frequently through the research process
- “Final” draft should be as good as you can make it
  - Review Grad Office formatting requirements
  - Proofread and edit; get help if you need it
- Major professor must approve it before you send to the committee
- Committee must approve it as defensible before you can defend

Committee approvals:
I have reviewed this thesis/dissertation and verified that it appears to be an acceptable manuscript in terms of technical quality and proper expression and usage in American Standard English. (You are encouraged to provide written comments to the student immediately following your review, so that the student may work on revisions prior to the defense.)
Defend

- The defense is the final exam of your degree
- Typically a 30-60 minute presentation, open to the public,
- Followed by an oral examination by your committee in private
- Additional revisions usually suggested
- Details on this process are in the next section of this workshop
The document
Creating and editing
When do you start writing?

- **When you start planning your research**
- Your proposal is the **first draft** of the thesis or dissertation!
  - Literature review to define the problem
  - Methods to plan how to tackle it
- Add to the draft as you read more papers, get results, create figures, interpret data.
- Put it all in; you can edit later
- For the final draft, you will be selecting, refining and interpreting what is already there
Dealing with writer’s block

• Treat it as an ongoing, evolving document
• Everyone’s first draft is imperfect!
• Don’t worry about writing well the first time
  • Get your thoughts down
  • Revise and edit later
• Write or edit something every week
• Update new lit review results or method changes as you go
• Make regular backups in at least two places
Revising with your major professor

- Check whether he/she prefers individual chapters as you go, or a single document at the end.
- Check preferred format (paper, Word, PDF)
- Perfect your writing so advisor can focus on your research, not your grammar
- Implement revisions before asking for more revisions!!!
- There will be MANY iterations between you and your major professor, often more than you anticipated.
  - Lots of red edits will be given to you and, it is important to note, you MUST develop a “Thick Skin” in response to this constructive criticism.
Thesis/Dissertation Guidelines

• Read this document early on
• Saves time if you format your proposal and early drafts correctly
• LaTeX template available
• Learn to use Word styles
• Learn EndNote

Thesis and Dissertation Writing Manual
Academic Year 2017-2018

Instructions for the preparation of theses and dissertations at the South Dakota School of Mines and Technology (SD Mines)

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Two style options

• Traditional Thesis/Dissertation

• Compilation of Journal Articles
The required components of an M.S. thesis or Ph.D. dissertation include the following. ALL components MUST be available for committee review prior to the defense.

- Title Page,
- Abstract,
- Acknowledgements,
- Table of Contents,
- List of Tables,
- List of Figures,
- Introduction
- Theory and/or Literature Search
- Methods
- Results
- Conclusions
- Bibliography,
- Appendices,
- Vita.

Chapter titles and organization are flexible to accommodate differences in disciplines, but these components should be present and recognizable.
Compilation of Journal Articles Style

- Title Page,
- Abstract,
- Acknowledgements,
- Table of Contents,
- List* of Tables,
- List* of Figures,
- **Introduction** to the full body of work represented by the articles
- **One or more journal articles,**
- **Conclusions** including a summary of conclusions from the articles and implications from the work as a whole
- Bibliography for references not in the articles,
- Appendices (include documentation for permission to reproduce published/copyrighted articles),
- Vita.

* - Note that the lists of tables & figures refers to tables and figures in the Introduction and the Conclusions.
Previously published material

• What if I publish a paper before it is included in my thesis/dissertation?
  • Publishers usually assert copyright ownership of papers they publish.
  • Most readily give permission for the paper to be reprinted in a thesis/dissertation, but it takes time.
  • Documentation of permission must be included in the first appendix of your thesis/dissertation

• Applies to accepted or published papers, not submitted ones
Your thesis or dissertation is a book

• Writing a book usually takes roughly a year.

• But you have some major advantages:
  • You have been working on the ideas, methods, results and conclusions for at least one or more years,
  • You have well-documented information on all of the above, because you have carefully recorded this in a notebook,
  • You have a major professor that is reading the book as it is written and providing useful feedback,
  • Major parts of your thesis/dissertation were succinctly outlined and defended before your committee.

• Realistically, most students need at least one semester to complete the thesis or dissertation, but this is the bare minimum.
More on the editing process

• There will be **MANY iterations** between you and your major professor, often more than you anticipated.
  • Lots of bold, red edits will come your way
  • Cultivate a positive attitude in response to constructive criticism.
  • Not all faculty as practiced in commending the positive as they are in finding things to fix…

• **Allow sufficient time to complete editing**
  • The “last draft” should be given to major professor for approval **8-10 weeks** before the end of the semester you intend to graduate.
Registration and Time Limits

• Students must be continuously registered for fall and spring for at least 2 credits
  • May request a formal leave of absence
  • May need to reapply if lapsed
• MS must be completed within 5 years
• PhD must be completed within 8 years
• You must be registered in the semester you complete the degree.
## Graduate Education Deadlines

### Table 2. Official Graduate Office Deadlines for the 2017-2018 Academic Year

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Fall 2017</th>
<th>Spring 2018</th>
<th>Summer 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission to Candidacy</td>
<td>8/31/2017</td>
<td>1/17/2018</td>
<td>1/17/2018</td>
</tr>
<tr>
<td><strong>Last day to apply for graduation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last day to submit thesis/dissertation to committee for review and</td>
<td>10/31/2017</td>
<td>3/23/2018</td>
<td>6/15/2018</td>
</tr>
<tr>
<td>to Grad Office (via D2L) for preliminary format check (The major professor must</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>review it first and give student permission to submit it to the committee and the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grad Office.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last day to submit defense schedule form</td>
<td>11/14/2017</td>
<td>4/6/2018</td>
<td>6/29/2018</td>
</tr>
<tr>
<td>Last day to hold defense</td>
<td>11/21/2017</td>
<td>4/13/2018</td>
<td>7/6/2018</td>
</tr>
<tr>
<td>Last day to submit thesis/dissertation (approved by committee) to the Graduate</td>
<td>11/29/2017</td>
<td>4/20/2018</td>
<td>7/13/2018</td>
</tr>
<tr>
<td>Office for proofreading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last day to submit thesis/dissertation to Graduate Office for the Dean’s</td>
<td>12/6/2017</td>
<td>4/27/2018</td>
<td>7/20/2018</td>
</tr>
<tr>
<td>signature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last day to submit Checkout Sheet for Graduate Students</td>
<td>12/13/2017</td>
<td>5/4/2018</td>
<td>7/27/2018</td>
</tr>
<tr>
<td>Last day for all requirements to be completed (course grades, projects, program</td>
<td>12/18/2017</td>
<td>5/9/2018</td>
<td>8/1/2018</td>
</tr>
<tr>
<td>requirements)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Failure to meet these deadlines may result in inability to complete the degree requirements in the same semester and a requirement to register for the following semester.*
Avoid the trap

- Typically 1/3 of students who apply to graduate do not finish in the same semester.
  - Writing not finished in time
  - More substantial corrections than anticipated
- **Allow 8-10 weeks from final draft to completion.**
  - Fall: give to major prof by mid-October
  - Spring: give the major prof by spring break
- Committees will NOT permit the defense to go forward unless the document is complete and the work sound
Finishing in the summer

- Not recommended because
  - Faculty are not on contract
  - Committee members may not be willing
  - Faculty are often busy or traveling
  - Getting reviews, meetings, and signatures is extra challenging
  - Summer deadlines come quickly!
    - Last day to defend comes in early July
    - Last day to submit final copy is mid-July

- Carefully consider your strategy
  - Get agreement and target date from committee FIRST
  - It may be better to skip summer and complete in fall
  - If you miss the summer deadlines, you pay TWICE
Who owns a thesis/dissertation?

• The ownership rights to theses and dissertations created by students is governed by SD BOR Policy 4:34 and the SD Mines policy IX-2.

• Students with questions regarding intellectual property, patents, and inventions are advised to review these policies and contact the SD Mines Office of Research Affairs with questions.
Restricted thesis or dissertation

Restricted-access theses or dissertations are restricted by either:

(A) Federal Law as (i) Export Controls: EAR (Department of Commerce), ITAR (State Department), FAC (Department of Treasury) or (ii) Antiquities Acts (some documentation of fossil-bed or Native American sites may need to be controlled, Department of Interior), or

(B) Intellectual Property concerns, namely proprietary Information (either by contract with a private company, or SDSM&T proprietary information).
Things to know about restricted work

• It shouldn’t delay graduation, but it restricts your ability to publish, and may impact your job search.

• Defense of restricted work is attended only by the committee. Library copies are not available until a designated time period is over.

• Restricted work must be declared as such when you apply to defend.

• Discuss whether your work will be restricted with your major professor before you start.
Questions?
https://www.sdsmt.edu/Academics/Graduate-Education/Grad-Ed-Forms/

Graduate Education

- Grad Ed Policies
- Grad Ed Forms

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