

Materials Science, Engineering, and Commercialization Program

Advancement to Candidacy Requirements

Application for Advancement to Candidacy

Students can access the “Application for Advancement to Candidacy” from the Graduate College website. The student should complete and sign the upper portion of the form and return it to the doctoral program director. Students must complete all required course work with the exception of dissertation credit hours and pass the Advancement to Candidacy Comprehensive Examination prior to applying for candidacy. The Advancement to Candidacy Comprehensive Examination can be taken in the last semester in which the student completes all required course work (with the exception of dissertation credit hours). When all requirements for admission to candidacy have been met (see below), the doctoral program director will forward the Application for Advancement to Candidacy to the dean of the Graduate College for review and approval.

The dean of the Graduate College approves advancement to candidacy once all requirements are met.

Before advancement to candidacy can be approved, students are required to complete the following:

- 1. Coursework Completion:** Students applying for candidacy must have completed all required course work (with the exception of dissertation credit hours) toward the doctoral degree with a GPA of 3.0 or higher on a 4.0 scale with no grade earned below “B” on any graduate course work to be applied toward the Ph.D. degree. Incomplete grades must be cleared through the Graduate College at least ten days before approval for advancement to candidacy will be granted.
- 2. Completion of Commercialization Boot Camps:** Students must have successfully completed both entrepreneurial boot camps.
- 3. Selection of Dissertation Committee Chair and Committee.** The student must identify a Dissertation Committee Chair (research advisor), who must be approved by the doctoral program director, the dean of the College of Science and Engineering, and the dean of the Graduate College. The student also must select a dissertation committee comprised of three additional members of the College of Science and Engineering's doctoral faculty and at least one external member from outside the College of Science and Engineering or the university. Other committee compositions are possible but require the approval of the dissertation advisor and the doctoral program director.
- 4. Preparation of Dissertation Research Proposal:** The student must choose a research topic with the approval of the student’s Dissertation Committee Chair. Preparation of a dissertation

proposal by the student and approval of this proposal by the student's Dissertation Committee Chair and a majority of the other members of the dissertation committee is a requirement for Advancement to Candidacy. The proposal must outline the problem to be studied, outline the substance and scope of the dissertation research, discuss the relevant literature, present the methodology to be used, and substantiate the feasibility of the proposed work by presenting preliminary data. The students must follow the proposal content and format detailed in the MSEC Student Handbook.

5. Preparation of Small Business Innovation Research (SBIR) Phase I Proposal: Each student will prepare an original grant proposal utilizing a current or recent Small Business Innovation Research Phase I grant proposal call from a federal agency. The purpose of this activity is to judge the student's ability to design a line of inquiry into a specific technical topic as well as to demonstrate their ability to incorporate all required sections of a grant proposal according to the requirements of the federal agency. The proposal will be based on seminal papers in the field of interest along with other pertinent research information. The topic of the grant proposal must be different from the planned dissertation research, although there might be some overlap in terms of the types of materials proposed or the ultimate function of the materials. As a guideline, the SBIR proposed work will be considered distinct from the proposed dissertation work if: a different materials from the dissertation is proposed for an application that is unique to the SBIR work; the materials that are the focus of the SBIR proposal are substantially the same as the dissertation work, but the application is different; or substantially different materials from the dissertation work are proposed for an application that is unique to the SBIR work. The proposal must follow the format used by a major granting agency, such as NSF, DoD, DoE, NIH, NASA, FDA, CDC or EPA, and must include all pertinent sections. The student will work with their Dissertation Committee Chair to ensure that the choice of granting agency is appropriate for the proposed research. To ensure consistency between students, if an NIH SBIR Phase I proposal is selected, the student must submit a supplementary document describing the commercialization of the proposed research, following the guidelines detailed in the MSEC Student Handbook. The student will submit the completed proposal, together with the grant proposal solicitation (typically termed Broad Agency Announcement (BAA) or Funding Opportunity Announcement) to the committee at least one week prior to the Advancement to Candidacy Examination (part 7 below). Approval of the proposal by the student's Dissertation Committee Chair and a majority of the other members of the dissertation committee is a requirement for Advancement to Candidacy.

6. Furnish Documents to the Dissertation Committee: Prior to writing the SBIR Phase I proposal, the student will present the supporting material including the identification of the specific grant proposal solicitation for SBIR Phase I proposal along with the topic of the proposal in the form of an abstract to the dissertation committee for approval. This must be done at least 4 weeks before the Advancement to Candidacy Examination (part 7 below). The completed dissertation proposal and SBIR Phase I proposal must be provided to the student's

dissertation committee at least one week prior to the scheduled date of the Advancement to Candidacy Examination (part 7 below).

7. Satisfactory Performance on Comprehensive Advancement to Candidacy Examination: The Advancement to Candidacy Examination will consist of three parts:

1. Oral presentation and defense of dissertation research proposal
2. Oral presentation and defense of SBIR proposal
3. Oral examination

Parts “a” and “b” are to be conducted as a public forum, and the student will be expected to answer questions from the audience. Part “c”, the oral examination, will be restricted to the student and the student’s dissertation committee members. Students must notify MSEC administrative staff about the date, time and location of the candidacy examination at least one week prior to the exam so that MSEC faculty and students can be notified about the event.

The oral examination (part c) will assess the student’s preparedness to carry out the proposed plan of dissertation research. Specifically, the dissertation committee will question the student about the two proposals and the sub-discipline the student has chosen for his or her dissertation research. Students will be expected to exhibit breadth in their major area of interest and in ancillary fields.

All of the student’s dissertation committee members must be in attendance for the entirety of the candidacy examination; remote attendance of committee members via videoconference is permitted in extenuating circumstances. If needed, the Advancement to Candidacy Examination can be carried out in parts, with the oral presentation of the dissertation proposal taking place on one day, and the oral presentation of the SBIR proposal taking place on a separate day. However, each of these public presentations will need to be followed, on the same day, by closed oral examination of the proposal attended only by the student and Dissertation Committee.

Following the oral questions and answers during the closed oral examination by the dissertation committee, the student will leave the examination room. The members of the dissertation committee will determine if the student has passed the oral examination. The student will pass the exam if there is no more than one dissenting vote. [The committee may postpone the vote to pass the oral examination if deficiencies in the documents (including the SBIR proposal) are identified, pending corrections to these documents. In this case, the documents must be corrected and resubmitted to the committee within a reasonable timeframe set by the committee, but no later than the end of the semester that the exam was administered.] Should a student fail the exam, they will have the option of taking a second Advancement to Candidacy Examination, which must be passed by the end of the following semester. Failure to pass this exam on two occasions will lead to the student's dismissal from the Ph.D. program.

The student's Dissertation Committee Chair and other dissertation committee members must indicate approval of the dissertation proposal and dissertation proposal defense on the **Dissertation Proposal and Proposal Defense form (form D)**. In addition, the **Doctoral Comprehensive Examination Report form (form C)** and the **Application for Advancement to Candidacy (form E)** must be completed. These forms may be downloaded from the Graduate College's website. Electronic signatures are allowed. A final copy of the dissertation proposal, accompanied by the signed approval forms, must be turned in to the Doctoral Program Director, who will forward them to the Dean of the College of Science and Engineering and the Dean of the Graduate College for review and approval. The Dean of the Graduate College will approve advancement to candidacy once all requirements are met.

Timeline for Advancement to Candidacy

Students are encouraged to complete the dissertation proposal, SBIR proposal and advancement to candidacy examination as early as possible during their second year in the program, typically by the end of their 4th long semester in the program. Full time students typically also complete all their coursework (with the exception of dissertation credit hours) by the end of their 4th semester. Thus, full time students should advance to candidacy by the end of their 2nd year in the program. All full-time students are required to have advanced to candidacy by the end of their third year in the program. Requests for a time extension must be submitted to the doctoral program director by the student with the concurrence of the Dissertation Committee Chair and must be approved by the Graduate College. Non-traditional, part-time students are encouraged to advance to candidacy within one long semester after completing all required course work (with the exception of dissertation credit hours). Part-time students may request extensions from the doctoral program director as long as they maintain a minimum GPA of 3.0 and are making consistent progress toward fulfilling their degree requirements.

No credit will be applied toward a student's doctoral degree for course work completed more than five years before the date on which the student is admitted to candidacy. This time limit applies to course credit earned at Texas State, as well as course credit transferred to Texas State from other accredited institutions.

Format for Dissertation Proposal

The dissertation proposal should stand on its own as a document that introduces the motivation for the work, proposed research, and preliminary data to the reviewers (i.e., your dissertation committee). It needs to be written in such a way that it concisely demonstrates your understanding of the material, puts forth a solid reasoning for the proposed research, specifies the methods to be utilized in the process, and describes how this research will advance fundamental knowledge in the field.

Format:

- o 20 – 25 pages (not including references)
- o Utilize the Microsoft Word template provided by the Graduate College and read the formatting guidelines to properly format your dissertation proposal. Section III includes a formatting checklist for each section of the document.

Sections Required: At the minimum, the dissertation proposal must include these sections. Page limits for each of these sections are suggested. The order of the sections may be revised as needed to ensure proper flow upon consultation with your research advisor.

- o **Title Page (1 page, not counted in the page limit):** Include the title of the proposed work, your name, the names of the chair and members of your dissertation committee.
- o **Abstract or Summary (typically 1-3 pages):** The abstract should summarize the motivation, problem, proposed research, and the goals and scope of the proposed work. This section should stand alone, meaning that the reviewer should get a very good idea of all the content of the proposal simply by reading it, without the need for more background. This section could be written in a format similar to a “Specific Aims” page for an NIH grant or a “Project Summary” page for the NSF. Follow the “Abstract” formatting guidelines provided by the Graduate College.
- o **Background (4 – 8 pages):** Provide a succinct summary of background directly related to the problem being addressed and to the proposed solution. You may break this section into subsections as needed. Make sure to tie in the background to the problem and proposed research. That is, as you describe the background, make sure that you explain how it is relevant to the work described in the proposal. Use this space wisely. The proposal is not meant to be a review paper. This and the following sections should utilize the “Text Section” formatting guidelines provided by the Graduate College.
- o **Proposed Work (1 – 5 pages):** Explain in detail what it is that you are proposing to do to address the problem identified. You may include schematics of the material’s design, flow charts of processes, data supporting the idea, etc. You may also explain the significance or impact of the proposed work here and how this work advances fundamental knowledge in the field.
- o **Proposed Research Plan (5 – 10 pages):** This is one of the main parts of your proposal as it shows your committee that you have put significant thought into how you will achieve your proposed work. This section is typically better organized by breaking it into 2-4 goals. Within each goal, describe in detail the tasks to be carried out, including the instrumentation or techniques to be employed, reagents/supplies to be utilized, characterization methods that will be

needed, etc. Avoid the use of simple “task lists”. Include schematics of proposed work as necessary (for example chemical synthesis schematics, in vitro or in vivo workflow charts, etc.). Specify variables that will be studied and controls to be utilized. Identify milestones that would demonstrate success for a task, if applicable. Identify potential issues that could be encountered during the performance of the research and provide suitable ways to overcome them.

- o **Preliminary Data (2 – 5 pages):** Provide preliminary data gathered by you that supports the feasibility of the proposed work. This section should demonstrate that you have already made significant progress and convince the committee that you are capable of achieving the goals proposed. This section may be either presented separately, or could be combined with the proposed research plan above.

Figures

- o Figures should be inserted in such a way that they are wrapped by text so as to utilize space wisely
- o Number and title each figure and cite each figure within the text
- o You may utilize a smaller font size for figure legends (see “Tables, Figure, Illustration, etc. formatting guidelines provided by the Graduate College)

References

- o Cite all references in numbered format through the proposal utilizing a suitable reference format for your field
- o Provide a formatted list of cited references at the end of your proposal
- o There is no page limit for your references cited
- o We recommend that you use a citation management software such as Endnote (which can be obtained for free from the university here), Zotero or Mendeley. Please select the software upon consultation with your PI.
- o Follow the “References” formatting guidelines provided by the Graduate College.

MSEC SBIR Proposal Commercialization Guidelines

For SBIR solicitations that do not specifically call for a commercialization section, such as those of the NIH, the supplementary commercialization document should follow the guidelines below.

- Describe the market and addressable market for the innovation (i.e the market opportunity)
- Discuss the potential economic benefits associated with your innovation
- Describe your customers and your basic business model. Describe the competition.
- What are the key commercial risks in bringing your innovation to market?
- Introduce your Company/Team as well as the Intellectual Property protection strategy that the company will pursue
- Describe your commercialization approach.
- Provide estimates of the revenue potential, detailing your underlying assumptions.
- Describe the resources needed to implement your commercialization approach.
- Describe your plan and expected timeline to secure these resources.

The recommended length is 1 – 4 pages utilizing the formatting guidelines indicated by the agency of the SBIR proposal call utilized.