

# HANDBOOK OF THE GRADUATE PROGRAM

REQUIREMENTS, POLICIES, AND PROCEDURES  
*SCHOOL OF POLYMER SCIENCE AND ENGINEERING*



*Academic Year 2020–21*

Shelby Freland Thames Polymer Science Research Center



[www.usm.edu/polymer](http://www.usm.edu/polymer)

## Table of Contents

|                                                        |                   |
|--------------------------------------------------------|-------------------|
| <b>Introduction .....</b>                              | <b>1</b>          |
| <b>Graduate Program Requirements .....</b>             | <b>2</b>          |
| Entrance Examinations .....                            | 2                 |
| Graduate Degree Requirements.....                      | 2                 |
| <b>Master of Science Program.....</b>                  | <b>2</b>          |
| Admission Requirements.....                            | 2                 |
| Program Requirements .....                             | 2                 |
| M.S. Degree Titles .....                               | 3                 |
| Time Limitations.....                                  | 3                 |
| <b>Doctor of Philosophy Program.....</b>               | <b>3</b>          |
| Admission Requirements.....                            | 3                 |
| Program Requirements .....                             | 4                 |
| Time Limitations.....                                  | 5                 |
| <b>Grading Policies.....</b>                           | <b>5</b>          |
| <b>Academic Probation .....</b>                        | <b>6</b>          |
| <b>The Polymer Science Seminar Series .....</b>        | <b>6</b>          |
| <b>The Graduate Advisor Selection Process .....</b>    | <b>6</b>          |
| Policy for Mid-Term Students.....                      | 7                 |
| Policy for 1 <sup>st</sup> Year Students on RAs .....  | 7                 |
| <b>The Written Comprehensive Examinations .....</b>    | <b>7</b>          |
| <b>The Graduate Advisory Committee .....</b>           | <b>8</b>          |
| <b>The Dissertation Prospectus .....</b>               | <b>8</b>          |
| <b>The Independent Proposal/Oral Examination .....</b> | <b>9</b>          |
| Independent Research Proposal Guidelines .....         | 10                |
| <b>Research Tools .....</b>                            | <b>14</b>         |
| <b>Residency Requirements.....</b>                     | <b>14</b>         |
| <b>Outside Employment Policy .....</b>                 | <b>15</b>         |
| <b>Thesis and Dissertation Timetable.....</b>          | <b>15</b>         |
| <b>Continuous Enrollment Policy .....</b>              | <b>Appendix A</b> |

*This handbook complies with the USM academic policies as stated in the Graduate Bulletin (2020-21). In the event of any inconsistency, the policies approved by the Graduate Council and the University will take precedence. This handbook was last updated in August 2020. The policies and requirements in this handbook are subject to change, pending full faculty vote of approval.*

## **Introduction**

The principal function of a university is to educate by creating an atmosphere that stimulates and supports the growth and communication of ideas. Scientific research departments should ideally have the dual mission of:

- sharpening the thinking processes, the practical skills and the creativity of students, and
- relentlessly probing the unknown from a position of knowledge at the frontiers of science in order to meet the technological needs of a modern industrial society.

In the Polymer Science Research Center at the University of Southern Mississippi we take this mission seriously. We endeavor to produce top-quality polymer scientists; therefore, in order to meet this goal, we are obliged to conduct first-rate, world-class scientific research.

The goal of the graduate program is to educate incoming students in the theory and practice of polymer science and engineering. As a student in our program you will be introduced to the unknown factors in the frontiers of polymer science and engineering. You will learn how to approach and execute a research program to further understanding and develop skills necessary to conduct independent studies. In the process you will receive valuable training for a future career in academia, commerce or industry, particularly in industries that manufacture, process, develop, and use polymeric materials.

The thrust of our program is to educate by active participation. Students engage in their research under the guidance and supervision of a faculty member. The current state of polymer science is revealed to students through formal courses, seminars, colloquia, independent reading and daily interactions.

The environment is exciting and stimulating - the variety and vigor of the wide-ranging research areas provide an impetus for achievement.

## **The PSRC Environment**

The Shelby F. Thames Polymer Science Research Center (PSRC) is a smoke-free and drug-free workplace: no smoking or tobacco use is allowed in the PSRC, and drugs of any kind (including alcohol) are explicitly forbidden from being present or used on the USM campus and in the PSRC.

Students found to be in possession or believed to be under the influence of alcohol, illegal drugs, or prescription medications that impact cognitive and/or motor skills are subject to disciplinary action, up to and including dismissal from the program.

We are pleased to make available to you carrels in which to work and study during your first year of graduate study. We believe you will find them to be a positive part of your academic environment. Please abide by the following rules concerning the use of the graduate study area.

- **Please do not tape or tack anything to the walls or desks.**
- **Please keep the area clean.** This is especially important in the coffee/snack area. If spills do happen, notify Charles "Chuck" Collen in the main office immediately, so arrangements for cleaning can be made before permanent damage sets in.

You will be required to clear your personal items out of your carrel and the graduate study area following your completion of the written comprehensive exams, as you move into your respective research labs.

## **Graduate Program Requirements**

- I. ENTRANCE EXAMINATIONS.** (M.S. and Ph.D. Students) Due to the diversity of student backgrounds, the School requires all entering graduate students to take examinations covering undergraduate organic and physical chemistry, and calculus. The tests are designed for background assessment and administered one week before classes begin. Undergraduate remedial coursework may be assigned in any area found to be deficient. A minimum grade of B is expected in all undergraduate remedial coursework.
- II. GRADUATE DEGREE REQUIREMENTS.** See the Graduate Bulletin sections on General Degree Requirements for Master's Degree Requirements and Doctoral Degree Requirements. Note that the specific academic requirements (outlined in this PSE Handbook) of the School of Polymer Science and Engineering are, in certain aspects, more detailed and/or restrictive than those listed in the General Academic Requirements section of the Graduate Bulletin. For answers to specific questions regarding these requirements, please consult the School graduate advisor.

**The School Graduate Advisor for 1<sup>st</sup> year students supported by departmental TA assignments:** For the **first two semesters** of graduate work (i.e., before the student has selected a research advisor), your academic advisor will be appointed by the School Director and assisted by the Graduate Coordinator.

**Graduate Advisor for 1<sup>st</sup> year students supported by research assistantships:** For the **first two semesters** of graduate work, your research advisor will officially be your academic advisor. For issues concerning the specific program requirements, please consult the departmental advisor.

**First year** students are not allowed to withdraw from a registered class or otherwise modify their course schedule without express written permission from the Graduate Advisor as approved by the School Director. No changes in official assignments or graduate duties are allowed without the permission of the Graduate Advisor and School Director.

### **MASTER OF SCIENCE PROGRAM (M.S. in Polymer Science and Engineering)**

**Admission Requirements.** Admission to the master's program is based upon previous academic performance and scores on the Graduate Record Examinations (GRE). Requirements include the following: a minimum grade point average of 2.75 or better on the last 60 hours of undergraduate work, three letters of recommendation and submission of scores on the GRE.

**Program Requirements.** Graduation is based upon:

- Satisfactory completion of a total of 36 hours (PSE 701, 702, 710, 711, [either 703 or 712], 720, 721, 730, and including research PSE 691) with an overall graduate GPA of 3.0 or higher.
- Six (6) credit hours of 698-Thesis must be completed before graduation. Students must be registered for at least one (1) hour of 698-Thesis during the

semester/term in which he or she defends.

- MS students may substitute up to 6 hours of coursework toward the MS degree with approval from their research advisor and School Director.
- Satisfactory\* development of an original research project and completion of a master's thesis.
- Satisfactory\* completion of the final comprehensive examination (i.e., the oral defense of the master's thesis).

*\*Satisfactory completion of these additional requirements is determined and approved by the student's advisory committee (see below).*

All on-campus graduate students must complete the safety course (PSE 510) within three semesters of enrollment. All graduate students must register for PSE 789 (Seminar) for one credit hour each semester they are enrolled beyond the first year, including the semester in which they graduate. Exceptions to the above requirements are permitted on a case by case basis. Students should enroll for the maximum number of hours covered by their tuition waiver. Excess hours or improper registration will result a charge that is the student's responsibility.

**Time Limitations.** The student must complete the master's degree within five calendar years from the date of initial enrollment in the graduate program. Special petition to the Graduate School will be required to revalidate over-age credit hours (see the Graduate Bulletin for details). Unless unusual extenuating circumstances exist, the department/faculty will not grant financial support, via assistantships or fellowships, to a student who has **exceeded three years** in the M.S. program.

**Holiday Policy.** All first-year graduate students are expected to adhere to the holiday schedule set by the School's director and all other graduate students will adhere to their major professor's schedule.

## DOCTOR OF PHILOSOPHY PROGRAM

### (Ph.D. in Polymer Science and Engineering)

**Admission Requirements.** M.S. track students may be reclassified as Ph.D. track students. Demonstrated excellence is required in coursework and a passing grade in the comprehensive examinations before a master's-track student is officially reassigned to the doctoral program.

Regular admission directly to the Ph.D. program may be granted to BS or MS degree holders upon approval of the PSE Graduate Admissions Committee. Admission of students with previous graduate coursework or master's degrees from other institutions will be considered on an individual basis.

**The Ph.D. program requires:**

- No more than 2 grades lower than a **B** in the first 26 hours of core courses.
- A minimum GPA of 3.5 in at least 30 hours of graduate courses taken at USM, including the core courses and research.
- Passing all three sections of the written comprehensive examination.
- Passing an Oral Examination that follows the completion of a written Independent Research Proposal.

Ph.D. students who do not meet the above requirements will be moved to the master's degree track or dismissed from the program

**Specific Requirements for the Ph.D. Program.** All Ph.D. students must complete the safety course (PSE 510) in their first three semesters of enrollment. All graduate students must register for PSE 789 (Seminar) for one credit hour each semester they are enrolled, or as advised by the Student Services Coordinator. Students should enroll for the maximum number of hours covered by their tuition waiver. Excess hours or improper registration will result a charge that is the student's responsibility.

The 26 hours of graduate core courses in the regular PSE curriculum (PSE 701-702-703; 710-711-712; 720-721; 730-745) must be completed with no more than 2 grades lower than a **B** in the first 26 hours of core courses. Only one graduate level course may be retaken for GPA improvement and students must indicate in writing which course is being retaken for this purpose. Note that this grade improvement cannot be used to satisfy the Ph.D. track requirement (see above).

Ph.D. students must complete 54 hours (including core courses, research tools, research PSE 691/791, and at least two 800 level courses) with an overall graduate GPA of 3.0 or higher. For research credits, students should register for appropriate research hours in PSE 691 until they have been completed their oral comprehensive examination. Beyond this point, students should register for PSE 791. All of the above-required courses must be completed **before** the term in which the student defends.

Additional program requirements for graduation:

- Satisfactory\* development and presentation of an original Research Prospectus in written and oral formats (see detailed requirements, below).
- Satisfactory\* completion of a written Independent Research Proposal and Oral Examination (see detailed requirements, below).
- A minimum of 9 credit hours of 898-Dissertation must be completed before graduation. Students must be registered for at least three (1) hour of 898-Dissertation during the semester/term in which he or she defends.
- Satisfactory\* completion of a final written Dissertation and Oral Defense.

*\*Satisfactory completion of these additional requirements is determined and approved*

by the student's advisory committee.

**Time Limitations.** Courses taken above those required of the master's degree or its equivalent, which fit into the degree program but which are **six or more years old** at the time of admission to the advanced graduate program, may be counted toward meeting degree requirements (with special petition) when recommended by the Department Chair and approved by the Graduate Dean. **The comprehensive exam** (both written and oral components) must be completed within a period of **six years** after the student has been admitted to advanced graduate standing at the University of Southern Mississippi. If a student fails to meet this deadline, the original written comprehensive examination will become **invalid** and must be retaken during the next regular examination cycle.

Unless unusual extenuating circumstances exist, the department/faculty will not grant financial support, via assistantships or fellowships, to a Ph.D. student who has **exceeded six years** in the Polymer Science graduate program.

**Holiday Policy.** All first-year graduate students are expected to adhere to the holiday schedule set by the University and all other graduate students will adhere to their major professor's schedule.

**III. GRADING POLICIES.** All letter grades given at the completion of a student's course work are subject to the specific grading policies of the individual faculty members. A "general" guideline for grading in the Department is as follows:

- a grade of **A** typically indicates that the student's work is of unusually high quality;
- a grade of **B** indicates that a student has demonstrated a generally solid understanding of the course material;
- a grade of **C** indicates that a student has demonstrated a poor understanding of the subject and has performed below that which is expected.;
- a grade below a **C** indicates that the student has serious deficiencies in the subject material. A grade of **D** or below will not apply toward a graduate degree, and may yield a status of *Academic Probation* (see below);
- Faculty members and instructors have the option to assign grades with the "+" and "-" system. These modifiers have significant impact on student GPA.
- Faculty members who have given incompletes (**I**) will receive a reminder of these incompletes in the middle of each semester. If an "**I**" has not been removed by the next semester (excluding summer term), it automatically becomes an **F**. Students are prohibited from enrolling in any course for which the current grade is "**I**". A grade of **E** (course in progress) is appropriate for thesis (PSE 698) or dissertation (PSE 898) until the defense is completed, then a grade of **P** (Pass) or **F** (Fail) will be assigned.

**IV. ACADEMIC PROBATION.** Regularly admitted graduate students will be placed on a status of Academic Probation if:

- The student earns 2 **C**'s during the first semester of core course work, **or**
- The student earns 1 grade below a **C** during the first semester of core course work, **or**
- The student's **Overall GPA** falls below a **3.0**.

If a student is placed on Academic Probation, he/she is then required to remove this status by earning grades in the regular PSE curriculum that are sufficient to raise their **Overall GPA** to a **3.0** or higher. Failure to remove the status of academic probation, or if the student earns more than 3 grades of a **C** (or lower) in the core courses, will result in the student no longer be considered a candidate for a graduate degree in Polymer Science.

A student who's GPA falls below a 3.0 and are placed on probation by the Graduate School is subject to having their tuition waiver revoked during the probationary semester. In this event, the student will be required to pay their full tuition. Continuation of the students stipend will be at the discretion of the PSE faculty and 1<sup>st</sup> year graduate advisor.

**V. THE POLYMER SCIENCE SEMINAR SERIES (PSE 789).** First year graduate students must attend PSE 789 (Seminar) as a requirement of receiving their stipends. First year students are expected to participate in the question and answer sessions during seminar.

All other graduate students must register for PSE 789 (Seminar) for one credit hour each semester they are enrolled, including the semester in which they graduate. The Polymer Science Seminar Series course includes both the regular student seminars held on Wednesday and Friday afternoons and the scheduled Wednesday afternoon Polymer Science Symposium Series. The Polymer Science Symposium Series offers external speakers from academia and industry and covers a wide range of topics on the frontiers of Polymer Science. The grades for this one-hour course are based on student participation in the question & answer sessions and on student attendance.

**VI. THE GRADUATE ADVISOR SELECTION PROCESS.** During the first year of coursework all 1<sup>st</sup> year students are encouraged to investigate the research interests of each of the graduate faculty. Since the field of Polymer Science is broad and multidisciplinary, the faculty feel that it is important that the student is not burdened with the choice of advisor before he/she encounters a detailed introduction to the field through the core curriculum. During this period, the faculty have also agreed to refrain from "hard-sell" recruiting tactics. In the spring semester of each year, the graduate faculty will present to the 1<sup>st</sup> year students an overview of their respective research interests and available projects. After all of the faculty have presented their research overviews, the students will be required to interview at least three faculty for the purpose of selecting an advisor with desirable research interests. The students will then rank their three choices on a graduate advisor selection form and submit the form to the departmental chairman. During a subsequent faculty meeting, student selection will be finalized, and the students will be notified of the outcome.

Students are expected to complete their graduate research under the supervision of their selected advisor. However, in the event of extenuating circumstances a student may petition the School to change advisors. In this case, the following procedure must be followed:



1. The student must complete a “request change of advisors” form and submit it to the graduate advisor and the department chair. The department chair may bring the request to the next available faculty meeting.
2. If the change is approved, the student will be expected to write up all of the research that was completed with the original advisor.
3. The student, following the advice of the new advisor, will select a new committee.
4. The new advisor will schedule a new dissertation prospectus defense that the student will defend in accordance with the new project.

**Policy for Mid-Term Students:** Mid-term students (i.e., students that first entered the program in the Spring semester) are given the opportunity to delay their advisor selection until **November 1** in order to have sufficient time to fully interview all faculty. Mid-term students are also recommended to work in one of the PSRC research groups during their first summer term with the understanding that this employment in no way obligates the student to select that specific faculty member as their research advisor during their regular advisor selection process in November.

**Policy for 1<sup>st</sup> Year Students on RAs:** Obviously, 1<sup>st</sup> year students who entered the program on RA (i.e., supported from day 1 on a research grant managed by one of the PSE faculty) are exempt from this selection process. However, the RAs must attend all faculty presentations in order to be educated (with the other 1<sup>st</sup> years) about the different research programs in the department. Other policies concerning the required activities of the 1<sup>st</sup> year RAs are listed here.

- 1<sup>st</sup> year RAs are strongly encouraged to reside in the graduate study lounge (i.e., bullpen) during the first two academic (core) semesters.
- 1<sup>st</sup> year RAs are required to take the full load of core courses (i.e., the same load as that required of the 1<sup>st</sup> year students on departmental TAs) beginning with their entering semester.
- 1<sup>st</sup> year RAs are exempt from assignment with other departmental support or teaching activities.
- 1<sup>st</sup> year RAs are required to fulfill the research requirements as outlined by their research advisor during this 1<sup>st</sup> year period.
- 1<sup>st</sup> year RAs are required to take the comprehensive exams immediately following completion of their two core curriculum semesters (i.e, on the same schedule as their fellow TA classmates).

**VII. THE WRITTEN COMPREHENSIVE EXAMINATIONS.** (Ph.D. track) After satisfactory completion of the 27-hour core curriculum, students wishing to pursue the Ph.D. track are required to take the written comprehensive examination. The written comprehensive examination is offered *twice a year* at the end of the spring term but before the summer term, and during the break period between the Fall and Spring semesters. The Department requires a three-section examination, each section consisting of three exams and occupying one day, in the areas of organic, physical, and practical polymer science. While coursework forms the basis for this exam, questions may also cover seminar topics as well as recent literature in

polymer science. Students must pass all three sections of the comprehensive exam in order to be considered for admission to or to continue in the Ph.D. program. A student passes a section if they pass two out of three tests making up that section. A double blind number system will be used for the comprehensive examination to help ensure confidentiality. If a student fails any section of the examination, the student must retake and pass that section of the comp during the next regularly scheduled examination period. A student may only retake the exam or a section of the exam **one** time. When the exams are passed, a “*Results of Comprehensive and/or Qualifying Exams Form*” is sent to the Graduate School by the Department stating that the **written** portion of the Doctoral Comprehensive Exam requirement has been satisfied. *Note that the Graduate School requires both a written and oral component to the Comprehensive Examination. Both components are satisfied only after the student passes the Oral Examination (following the Independent Proposal Defense, see below).* If a student fails the written comprehensive exam after the **one retake attempt**, then that student will be considered on the Master’s track only.

**VIII. THE GRADUATE ADVISORY COMMITTEE.** (M.S. and Ph.D.) After consultation with their advisor, all students are required to interview other faculty members for the purpose of determining their willingness to serve as active participants on their Graduate Committee. Committee assignments must be approved by the graduate advisor. Upon mutual agreement, a *Graduate Advisory Committee Request Form* is signed by the committee members and the School Director, then submitted to the Dean of the Graduate School. The M.S. Committee consists of at least three members while the Ph.D. Committee consists of at least five members, including the Committee Chair (research advisor). This Committee must be appointed early in the student's program (well before the presentation of the Research Prospectus). It is expected that each student’s committee should be established within six weeks of the student passing the written component of the comprehensive examinations. For the Ph.D. committee, a minimum of four members of the committee must be regular tenured/tenure track faculty from the School of Polymer Science and Engineering. One or more committee members may be chosen from the PSE research faculty, and students are also encouraged to seek one or more members from other departments. One member may be from another school or industry, but only as approved through the School of Polymer Science and Engineering faculty, Graduate School, and the University Graduate Council (necessary paperwork is available through the Graduate School).

**IX. THE DISSERTATION PROSPECTUS. (Ph.D.)** Within **18 months** after successfully completing the written component of the comprehensive examination, the student is required to prepare a concise, yet detailed, written dissertation prospectus (typically 10-15 double-spaced typewritten pages), which includes an annotated bibliography and must be approved by the student's committee. The prospectus should summarize a detailed outline of research objectives for the dissertation project, and include the student's work accomplished to date. Since this formal requirement falls early in the student’s graduate program, it is expected that a significant portion of the prospectus will include a detailed literature review of the chosen research area. The written document must be presented to each of the student’s committee members at least **one week** prior to the previously selected, oral presentation date. Failure to meet this deadline may result in a grade of ‘F’ for the research prospectus examination. **The oral presentation of the prospectus is strictly limited to 25 minutes.** After the formal

presentation to the department and committee approval, a form is sent from the student's major professor to the Graduate School stating that the dissertation prospectus requirement of the Ph.D. program has been satisfied. *If the committee recommends corrections or modifications to the written document, the revisions must be completed and approved by the committee by the end of the Fall or Spring term following the semester in which the oral presentation was conducted. Failure to complete the necessary corrections or modifications within these defined time limits will result in a seminar grade of 'F' for the semester in which the deadline occurs and for each successive semester in which the completed document, signed by the committee, is not submitted to the School's Student Services Coordinator.*

As part of the committee approval, the student's proficiency in written and spoken English will be evaluated. If the student does not demonstrate adequate English language proficiency, the student may be required to take remedial courses (to be determined by the committee) to improve English language skills. Cancellation of a student's prospectus or proposal within 2 weeks of the scheduled date may result in a "fail" for the first attempt at the prospectus or proposal. Exceptions are made for advisor or committee conflicts, severe documented illness, or bereavement. Any other exceptions are granted by the seminar coordinator and should be initiated by the student's advisor.

- X. THE INDEPENDENT PROPOSAL PRESENTATION AND ORAL EXAMINATION (Ph.D.).** The Independent Research Proposal and Oral Examination Defense is the final requirement to achieve Ph.D. candidacy. Completing an independent research proposal will expand a student's base scientific knowledge and provide a formal exercise in identifying research projects in interesting and promising areas of research. The objectives of the independent research proposal program are:

1. To provide students the opportunity to:
  - think deeply and creatively about a significant research problem and propose how that problem can be addressed experimentally.
  - develop writing skills by preparing a clear and concise scientific document.
  - develop oral presentation skills and engage in scientific discourse.
2. To provide students with a forum to receive constructive, critical feedback from faculty members.

Within **18 months** after successfully completing the prospectus examination, each doctoral student must submit an independently conceived and developed written proposal **not to exceed** 10 single-spaced pages (refer to detailed guidelines below) of text dealing with an original proposition **unrelated** to their dissertation research. Students are encouraged to discuss their proposal topic with their dissertation committee to ensure the topic is acceptable and unrelated to dissertation research. Students must submit one copy of the written proposal to each committee member at least **two (2) weeks** prior to the scheduled oral presentation. A title should be posted to all PSE faculty and students **one (1) week** prior to the scheduled oral presentation. For the oral examination, the student must not only be prepared to defend the written proposal, but should also be prepared to answer questions on coursework, seminars, and literature in polymer science and related areas. Following the oral

presentation of the proposal and the oral examination administered by the committee, the student will be informed of the outcome in the form of **Pass**, **Conditional Pass**, or **Fail**. A **Pass** indicates that the committee fully approves the written document, oral presentation, and the oral examination. A **Conditional Pass** typically indicates that the committee requires modifications to the written document. A **Fail** typically indicates that the student demonstrated serious fundamental deficiencies in the proposed idea, or serious deficiencies in the oral presentation and/or examination. Recommendations by the committee, following a **Fail** on this requirement, may include:

- A total rewrite of the proposal based on the original concept,
- A total rewrite of the proposal based on a new topic,
- A total rewrite of a new proposal with another scheduled oral presentation,
- A second oral examination at a later date, or
- Disqualification of the student for admission to (or continuation in) the Ph.D. program.

If the committee recommends corrections or modifications to the written document (i.e., with a **Conditional Pass**), the revisions **must be completed**, with committee approval, **by the end** of the Fall or Spring term following the semester in which the oral presentation was conducted. Failure to meet this deadline will result in a grade change to **Fail**, subject to the recommendations listed above.

If the committee recommends a total rewrite and/or a second oral examination (i.e., with a **Fail**), the student is granted **one** attempt to pass a retake of the oral comprehensive exam, with committee approval, **by the end** of the Fall or Spring term following the semester in which the original oral presentation was conducted. Failure to satisfactorily pass this retake of the oral comprehensive examination will result in an automatic disqualification of the student for admission to (or continuation in) the Ph.D. program.

Following a satisfactory completion of the independent research proposal and oral examination, a form will be sent from the School of Polymers to the Graduate School, stating that the student has completed all requirements of the Comprehensive Examination.

## **INDEPENDENT RESEARCH PROPOSAL GUIDELINES**

The following guidelines were taken in part from those used by the National Science Foundation for writing proposals and should be used to assist students in preparing research proposals for PSE Ph.D. degree requirements.

### **A. The Proposal Format**

The scientific text of the proposal should be attached to an introductory page with title and signature spaces. Please observe the following guidelines in preparing the proposal.

1. The first section of the Proposed Research should be a Project Summary of no more than one single-spaced typewritten page. The Project Summary should present the

rationale of the research, its scientific objective, and an estimate of the significance to the field of research if the objective is reached. Please see more detailed Project Summary guidelines in *para. 4(i)* below

2. The body of the proposal should enlarge upon the salient points presented in the Summary. In addition, it should provide a **brief** survey of pertinent literature, a section on the plan of attack on the problem, and any non-scientific matters which require explanation, for example, plans for access to specialized equipment, justification for special budgetary requests, etc. Please see more details about the project description in *para 4 (iii)* below.

3. **Proposal Pagination Instructions**

The proposal must be paginated, beginning with the Project Summary as page 1 and ending with the references as the last page.

4. **Proposal Margin and Spacing Requirements**

The proposal must be clear, readily legible, and conform to the following requirements:

- a. Use of only the approved typefaces identified below, a black font color, and a font size of 11 points or larger must be used:

- Arial, Courier New, or Palatino Linotype at a font size of 11 points or larger;
- Times New Roman at a font size of 11 points or larger; or
- Computer Modern family of fonts at a font size of 11 points or larger.

A font size of less than 10 points may be used for mathematical formulas or equations, figures, table or diagram captions and when using a Symbol font to insert Greek letters or special characters. PIs are cautioned, however, that the text must still be readable.

- b. Single spaced or no more than 6 lines within a vertical space of 1 inch;

- c. Margins, in all directions, must be at least an inch.

### **3. Page Formatting**

The proposer must use only a standard, single-column format for the text. Two-column formats will not be accepted since it can cause difficulties when reviewing the document.

The guidelines specified above establish the minimum type size requirements; however, PIs are advised that readability is of paramount importance and should take precedence in selection of an appropriate font for use in the proposal. Small

type size makes it difficult for reviewers to read the proposal; consequently, the use of small type not in compliance with the above guidelines may be grounds for the return of the proposal without review.

#### **4. Proposal Contents**

##### ***i. Project Summary***

The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity. The overview includes a description of the activity that would result if the proposal were funded and a statement of objectives and methods to be employed. The statement on intellectual merit should describe the potential of the proposed activity to advance knowledge. The statement on broader impacts should describe the potential of the proposed activity to benefit society and contribute to the achievement of specific, desired societal outcomes. It should not be an abstract of the proposal. It must clearly address in separate statements (within the one-page summary):

- the intellectual merit of the proposed activity; and
- the broader impacts resulting from the proposed activity.

The Project Summary should be written in the third person, informative to other persons working in the same or related fields, and, insofar as possible, understandable to a scientifically or technically literate lay reader.

##### ***Table of Contents***

A Table of Contents must be included. The table of contents is not included in the page limitations of the proposal.

##### ***ii. Project Description***

###### **1. Content**

The Project Description should provide a clear statement of the work to be undertaken and must include the objectives for the period of the proposed work and expected significance; the relationship of this work to the present state of knowledge in the field,

The Project Description should outline the general plan of work, including the broad design of activities to be undertaken, and, where appropriate, provide a clear description of experimental methods and procedures. Proposers should address what they want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified. It

must describe as an integral part of the narrative, the broader impacts resulting from the proposed activities, addressing one or more of the following as appropriate for the project: how the project will integrate research and education by advancing discovery and understanding; how the results of the project will be disseminated broadly to enhance scientific and technological understanding; and potential benefits of the proposed activity to society at large.

## 2. Page Limitations

Brevity will assist faculty reviewers in dealing effectively with proposals. Therefore, the Project Description **may not exceed 10 pages**. Visual materials, including charts, graphs, schemes, photographs and other pictorial presentations are *included* in the **10-page** limitation. Project Summary and References are *excluded* from the 10-page limitation. PIs are cautioned that the Project Description must be self-contained and that URLs **must not** be used because: 1) the information could circumvent page limitations; 2) the reviewers are under no obligation to view the sites; and 3) the sites could be altered or deleted between the time of submission and the time of review.

Conformance to the 10-page limitation will be strictly enforced by the students' graduate committee and may not be exceeded. Proposals that exceed the page limitation will be returned with the expectation that the document will be re-submitted in correct format prior 2-week submission deadline. Proposals that do not conform to the page limitation guidelines will be subject to a **Fail** as the outcome of the Independent Proposal.

## 3. References Cited

Reference information is required to support the information presented in the body of the proposal. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. If the document is available electronically, the website address also should be identified. Students must be especially careful to follow accepted scholarly practices in providing citations for source materials relied upon when preparing any section of the proposal. While there is no established page limitation for the references, this section must include bibliographic citations only and must not be used to provide parenthetical information outside of the 10-page project description.

## 4. Presentation:

The independent research proposal must be defended at a regularly scheduled graduate seminar. **The oral presentation of the proposal is strictly limited to 25 minutes.** The presentation must follow best practices in professionalism and in visual presentation.

## 5. Budget:

A budget for the proposed project must be included. The budget should follow the format laid down by the Sponsored Programs Administration of the University of Southern Mississippi. This format is described on the Web-page of the Sponsored Programs Administration. In general, all proposals must include an itemized budget that is reasonable for completion of the project. Budgets should be limited to \$100,000 per year, over a three-year period. Reasonable equipment charges may be requested, and the indirect charges are set at 47.5% of the modified total direct costs, excluding equipment costs.

## 5. Constraints and Suggestions

As in any proposal for which you are asking someone to put up real money, the basic idea must be good; it must be novel, creative and interesting, and it must show a real potential for success. Since this is an academic environment, and the purpose of this requirement is to broaden the educational horizons in the field of Polymer Science and Engineering, the proposal should clearly address **a fundamental scientific question and it must display the student's mastery of the fundamentals of Polymer Science and Engineering**. The following comments should also be helpful in developing the proposal.

- The **research objective of your independent research proposal should be based on hypothesis-driven research – NOT product design and development**. It is acceptable to use a specific application for motivation, but the outcome of your proposal should not be a product or a device for that specific application; the outcome should be the science that has potential to advance the field.
- In **hypothesis driven research**, your hypothesis should provide a strong rationale based on current data/knowledge/information, should further the field, should be a recurring theme throughout the proposal, should NOT be obvious or already answered. If the hypothesis statement is too obvious, perhaps you are not asking the right question.
- Strong proposals begin with a compelling “Need Statement” or “Problem Statement”. The aim of the need statement is to identify the compelling problems or issues that are leading you to propose a plan of action. The need statement also establishes a framework for the project goals, objectives, methods and evaluation. **An effective need statement does five things:**
  - Uses supportive evidence to clearly describe the nature and extent of the need/problem
  - Places the nature and extent of the need/problem in a broader context than the immediate setting
  - Illuminates factors contributing to the problem or the circumstance creating the need
  - Identifies current gaps in knowledge



- Provides a rationale for the transferability of the “promising approach” or “solution” to the problem that you propose
- Do not present a proposal that is only an incremental modification of an existing concept, method or idea. For example, a proposal outlining the development of a new peroxide initiator for polystyrene may be novel (“No one has ever done this before...”), but if, in the end, you still have ordinary PS, then the development is incremental and does not satisfy the proposal requirement. Also avoid the following scenario: “After reading the literature, I find that A, B, and C have all been reported separately with wild success. Deductive reasoning leads me to the hypothesis that if A, B, and C are good, then  $A+B+C$  = better.” In other words, resist the temptation to simply “combine” concepts to build your ORP.
- An excellent idea can help make up for poor implementation or missing components, but a poor idea cannot be saved by fancy footwork.
- Your ideas must be defensible: ask yourself, a) Does this make sense? b) Has anyone done this before? c) Does anyone **care** if I do this or not? d) Why is it important?
- Know the background science: this exercise is your oral defense of your basic knowledge and understanding of polymer science and engineering.

**XI. RESEARCH TOOLS.** (Ph.D., only) A selection of courses relevant to the student’s field of research is required in the doctoral program and shall consist of a minimum of **eight (8)** semester hours of graduate-level coursework. The courses selected to satisfy the Research Tools requirement must be approved by the student’s research advisor (on behalf of the student’s Graduate Committee) and may consist of a combination of courses in a number of related areas. Coursework in a 500-level series may be applied to the Research Tools requirement only if this coursework is formally approved by the student’s Graduate Committee (a signed research tools approval form must be submitted to the Departmental Graduate Advisor) or was declared to be compulsory by a previous departmental notice (e.g., remedial Chemistry courses). The courses selected to satisfy the Research Tools requirement may include courses in chemistry, physics, math, biology or some combination of science courses in these and related disciplines. All “Special Topics” 800-level Polymer Science and Engineering courses (including the two 800-level PS&E courses required for the Ph.D. program) may be used to satisfy this Research Tools requirement. Recent graduate coursework, that has **not** been used to satisfy some other graduate degree, may be considered to meet the requirement for Research Tools.

**XII. RESIDENCY REQUIREMENTS.** (Ph.D., only) At some point during the graduate degree program, all candidates must complete 24 graduate hours of continuous study on the Hattiesburg campus within the time limit of two consecutive semesters. Students holding assistantships may fulfill the residency requirement by earning a total of 24 semester hours within three consecutive semesters (including summer term).

- XIII. OUTSIDE EMPLOYMENT POLICY.** (M.S. and Ph.D.) Students receiving full-time support through teaching or research assistantships or other special federal or industrial fellowships may not engage in any outside employment. Other paid employment within the University is governed by the appropriate University regulations. The permission of the student's Advisor and the School Director must be obtained before this other employment begins.
- XIV. THESIS AND DISSERTATION TIMETABLE.** For the exact deadlines the student must meet for graduation, consult the Thesis and Dissertation Deadlines calendar obtainable from the Graduate School website. The oral defense must be publicly presented on or preferably before the due date of the "Results of Oral Defense Form" for the intended graduation semester. If the student is unable to obtain approval by that deadline, the student must defer their graduation by at least one semester. Students should consult with the Graduate Coordinator in order to obtain necessary forms for graduation.