

Kazuo Inamori School of Engineering

at

Alfred University

GRADUATE PROGRAM MANUAL

Updated February 2014

1. Purpose of the Manual

This Graduate Program Manual, which is intended as a reference for graduate students and faculty, describes the policies and procedures of the School of Engineering (SoE) graduate programs. This document is supplemental to the Alfred University's Graduate Academic Regulations and the current Graduate Catalog, both of which are available on-line at:

Regulations: <https://my.alfred.edu/academic-policies/academic-regulation-ug.cfm>

Catalog: <http://www.alfred.edu/academics/grad-catalog.cfm>

Students are encouraged to review the University's Graduate Academic Regulations because they contain important information not repeated in this manual. The policies in the University's Graduate Academic Regulations and current Graduate Catalog supersede those outlined in this manual. Graduate students who identify any policy or procedure in the SoE Graduate Program Manual which appears to be in conflict with university policies should bring it to the attention of their academic advisor and the Dean for clarification.

As a reference, Appendix A lists the individuals and committees responsible for the policies and procedures of the graduate programs. Current contact information for many of the individuals and offices listed can be found at: <http://www.alfred.edu/gradschool/contacts.cfm>

2. Admission and Enrollment

2.1 Admission

General policies regarding admission and transfer of credits are outlined in the AU Graduate Catalog. Applications to the graduate engineering programs are reviewed by the SoE Graduate Admissions Committee. Applicants to the M.S. programs are either accepted or denied admission. Accepted students are automatically placed on a waiting list for financial assistance, but may also enroll as self-funded students. Applicants to the Ph.D. programs are either accepted with an offer of a full assistantship, pre-accepted and placed on a waiting list for financial assistance, or denied admission. The School does not generally admit students to the Ph.D. program without a full assistantship in the form of a teaching assistantship, a research assistantship, a fellowship/scholarship, or guaranteed funding from an employer.

2.2 Transfer Credit

Due consideration will be given to graduate coursework done elsewhere and is at the discretion of the Dean, or his/her designee. In general, the transferred credits must be appropriate to the student's degree program and presented with a grade of B or better. No more than 6 graduate semester credit hours may be transferred into the master's degree programs, and no more than 15 credit hours will be allowed toward the Ph.D. Thesis credits are not transferrable.

Students with graduate credit from another institution should petition the Dean in writing within the first year of residency at Alfred University. The written petition should include a proposal for how the transfer credit might be applied to AU requirements, an official transcript from each university from which credit is claimed, and the catalog description for each transferred course claimed. All documents must be provided in English, or must be translated using an appropriate translation service. The student must bear any cost associated with the translation.

2.3 Length of Degree and Residency Requirements

The M.S. programs are designed to be completed in two to four semesters of full-time enrollment. The M.S. degree programs must be completed within six years of first enrollment, and students must maintain continuous enrollment.

The Ph.D. programs are designed to be completed within four years, and students must maintain continuous enrollment. The residency requirement for the Ph.D. program is four semesters of full-time enrollment.

2.4 Full-time, Part-time and Continuous Enrollment

Full-time enrollment is defined as 12 credits or more. Part-time enrollment may range from two to twelve credits per semester.

Full-time students in the School of Engineering are expected to enroll in 15 credits of combined coursework and thesis. Applicants admitted as full-time students are expected to maintain full-time status until they complete the degree, even after they have completed the minimum number of thesis credits for the degree. Students wishing to convert to part-time status must petition the Dean in writing. This petition should include the reasons for wishing to convert to part-time status and the projected timeline for completing the degree. As an example, students who have completed all of their research and are writing their thesis may petition to enroll in two-credits of thesis during their final semester.

Full-time tuition, while enrolled in the School of Engineering, only covers courses that count toward the degree program in which the student is enrolled, i.e. the tuition does not typically include courses taken within the College of Professional Studies, School of Art and Design, or College of Liberal Arts and Sciences unless they are part of a specified degree program. Occasionally, faculty in the other divisions of the university may offer courses with SoE designations; these are covered by the full-time tuition.

Applicants may be admitted to the programs as part-time students. Part-time students are also expected to maintain continuous enrollment.

Students who do not maintain continuous enrollment will be withdrawn from the university. Students who have been withdrawn, but who wish to return to complete their degree, may petition the Dean for retroactive enrollment. Students who do not intend to maintain continuous enrollment should consider petitioning for an official leave of absence as outlined in the Graduate Catalog.

3. Financial Aid

General financial aid policies are outlined in the AU Graduate Catalog. Following are the common types of financial assistantships available in the School of Engineering:

- *3-K Graduate Assistantship*: The *3-K Graduate Assistantship* is the minimum financial assistantship awarded to full-time students admitted into the M.S. program. It consists of a \$3000 stipend in exchange for 7.5 hours of work per week during the academic year. The assigned work duties may include teaching, equipment maintenance, and administrative support. The student is responsible for all tuition and fees and must maintain full-time status. Students receiving the *3-K Graduate Assistantship* are eligible to receive additional financial assistance, such as tuition or wages paid by a research grant. The student must report these additional earnings to financial aid and should be aware that they could affect other forms of financial aid such as loans.
- *Department Assistantship*: Two *Department Assistantships* are selected by the chair(s) responsible for the Mechanical Engineering, Electrical Engineering and Renewable Energy Engineering programs. This assistantship is equivalent to the cost of full-time tuition. A portion (25%) of the assistantship is paid as a stipend in return for 15 hours of work per week during the academic year. The assigned work duties may include teaching, equipment maintenance, and administrative support. The remainder of the assistantship is awarded as a tuition grant. The student must maintain full-time status and is responsible for all remaining tuition and fees. Students receiving the *Department Assistantship* are eligible to receive additional financial assistance, such as tuition or wages paid by a research grant. The student must report these additional earnings to financial aid and should be aware that they could affect other forms of financial aid such as loans.
- *NYSCC Teaching Assistantship*: Recipients of the *NYSCC Teaching Assistantships (TA)* are selected by the Dean, or faculty designee. The *NYSCC Teaching Assistantships* include an annual stipend of \$17,000, full tuition and fees. Recipients are expected to work at least 40 hours per week (minus in-class time). Up to 15 hours of the weekly work commitment may be assigned by the Dean or teaching supervisor. The remainder of the work is assigned by the thesis research advisor and shall be related to the thesis. At the research advisor's discretion, teaching assistants can also earn additional wages (up to \$2000 per year) for short-term analytical testing.

- *Full Research Assistantship: Full Research Assistantships* that cover an annual stipend of \$17,000, tuition, and fees, which are paid by research grants and contracts. Recipients are selected by a faculty research advisor. A work commitment of at least 40 hours per week (minus in-class time) is required. Typically work duties will be related to thesis, but the advisor can assign up to 15 hours per week towards other research, lab maintenance, or teaching activities. At the research advisor's discretion, research assistants can also earn additional wages (up to \$2000 per year) for short-term analytical testing.
- *Fellowships:* Fellowships are prestigious awards granted by government agencies, companies, professional organizations, or philanthropic organizations. All eligible students are encouraged to apply to fellowships after consulting with their thesis advisor. For more information about fellowship opportunities, please visit <http://www.asee.org/fellowship-programs/graduate>. Because fellowships typically offer financial incentives substantially greater than the assistantships described above, students receiving such fellowships must forfeit any AU-funded assistantship. The School will consider supplementing fellowships that do not offer full-tuition assistance. At the research advisor's discretion, fellowship recipients can also earn additional wages (up to \$2000 per year) for short-term analytical testing.
- *Miscellaneous Opportunities:* Research grants and contracts frequently provide partial assistance and employment opportunities for graduate students. These may take the form of tuition grants, hourly wages, stipends, and support for travel. The hourly wage for graduate students ranges from \$13.50 to \$20/hour depending on the nature and duration of funding. The student must report these additional earnings to financial aid and should be aware that they could affect other forms of financial aid such as loans. International students and their research supervisor should also discuss any work-related arrangements with the Office of International Programs to ensure that they comply with visa restrictions.

Most financial assistantships are awarded for a period of one or two semesters, and are renewable at the discretion of the research advisor or Dean, depending on the source of funding. As a guideline, financial aid will not be extended for a time beyond the recommended length of the degree. The M.S. program is designed to be completed in 3 or 4 semesters, depending on degree. The PhD. program is designed to be completed within 6 semesters after entering with an M.S. degree or 8 semesters after entering with a B.S. degree.

Financial assistantships may be terminated for poor academic performance or for failure to meet the associated work obligations. Decisions to terminate financial assistance because of poor academic performance are made by the Scholastic Standards committee at the end of each semester. Decisions to terminate the stipend because of unsatisfactory work performance are made by the research advisor and/or the Dean, depending on the source of funding. If a student fails to meet the work obligation, either in terms of attendance or

performance, the student's research or teaching supervisor should consult with the Dean's office. After consultation, the Dean's office may notify the student in writing that his/her funding may be terminated within a period of no less than 4 weeks. The notification (or warning) will state the nature of the problem, recommended remedies for correcting the problem within a specified period of time, and the consequences of failing to remedy the problem.

4. Academics

4.1 Degrees Offered and Requirements

The School of Engineering offers the following graduate degrees:

- M.S. Biomaterials Engineering
- M.S. Ceramic Engineering
- M.S. Electrical Engineering
- M.S. Glass Science
- M.S. Materials Science and Engineering
- M.S. Mechanical Engineering
- Ph.D. Ceramics
- Ph.D. Glass
- Ph.D. Materials Science and Engineering

The current requirements for the degrees are summarized in Appendix B and can be found online at <http://engineering.alfred.edu/grad/forms.cfm>. Students in the program can elect to fulfill the current requirements or those outlined in the AU graduate catalog for the year that they matriculated in the graduate program.

4.2 Undergraduate Deficiencies and Cross Listed Courses

Advanced degrees will be conferred only upon those candidates who have demonstrated adequate knowledge in the field of study. Students lacking the undergraduate preparation in the field of study may be advised to enroll in undergraduate courses, which do not count towards the graduate degree requirements.

Students may have an opportunity to take cross-listed courses at Alfred University. Cross-listed courses are a pair of one undergraduate and one graduate course that have similar course content and share a common lecture period. The two courses differ from each other in their assignments, exams, and/or grading standards. Only the graduate version of a cross-listed course will be applied to the graduate transcript. Undergraduates may take the graduate version of the course and have it applied to their graduate transcript, but they **MUST** inform the registrar of their intention before completing their B.S. degree. Graduate courses applied to the undergraduate degree requirements cannot be applied to the graduate transcript.

Students who have completed the undergraduate version of the course may not enroll in the graduate version of the course.

4.3. Graduate Seminar

All full-time graduate students must enroll in and attend Graduate Seminar, ENGR 690, each semester. No more than two absences, excused by the instructor of record, will be allowed per semester. If the scheduled seminar time conflicts with a graduate class or teaching assignment, the student may seek a semester-long waiver from the Dean. Failure to acceptably complete Graduate Seminar will be considered as unsatisfactory academic progress. Part-time graduate students are encouraged, but not required, to attend seminar.

4.4 Thesis Committee

All students are expected to select an advisor and a thesis advisory committee before the end of the first semester of graduate enrollment. This is accomplished by completing and submitting the Advisor and Thesis Committee Selection form to the Dean's Office - Graduate Program Secretary. All SoE graduate-program forms are found in Appendix B or on-line <http://engineering.alfred.edu/grad/forms.cfm>. Any changes to the thesis advisory committee should be communicated to the Dean's Office - Graduate Program Secretary in writing. The advisor will serve as the principal consultant/supervisor for the thesis, chair the thesis committee, and report the thesis-credit grades to the Registrar. The advisory committee is available to provide advice on the research project, the written thesis, and the student's professional development. The advisory committee shall arrive at all matters concerning the thesis by unanimity. In the unlikely event that such agreement cannot be reached, the question at issue must be brought to the School of Engineering Graduate Committee for decision by majority voting.

The thesis committee shall consist of (1) the thesis advisor and (2) at least two additional AU graduate faculty members for M.S. students or at least three additional AU graduate faculty members for Ph.D. students. Individuals who do not hold faculty rank at AU may act as additional non-voting committee members at the discretion and approval of the thesis advisor. The names of non-voting committee members do not appear in the students' thesis title sheet, but they may appear in the acknowledgments.

4.5. Thesis Progress and Report

After completing the first semester of enrollment, the **student is expected to meet with the thesis committee each semester to update them on the progress towards completion of the degree.** Starting with the second semester of enrollment, the student should (1) deliver a formal presentation to his/her committee and (2) submit a completed copy of the Graduate Student Progress Report to the Dean's Office - Graduate Program Secretary before mid-term break. Before midterm grades are due, the Graduate Program Secretary can prepare a list

identifying which students have not submitted their progress reports. This list will be sent to advisors, who will be responsible for submitting P/I midterm grades. Students receiving an "I" will be notified that they must meet with their committee by semester's end. The list will be updated prior to finals, and the advisors will be responsible for submitting P/NC grades. After the advisory committee meeting, the advisor will consult with the advisory committee to complete the student assessment form, discuss the completed form with the student, and submit the completed form to the Dean's Office.

4.6. Publication Requirements

Publishing in peer reviewed journals is important to a graduate student's professional development as well as the reputation of the institution. Prior to defending the master's thesis, the candidate must prepare and submit at least one manuscript for publication in a peer-reviewed journal or peer-reviewed conference proceedings. Because the M.S. program is completed in a relatively short period of time, the manuscript does not need to be accepted by the journal, but must meet the approval of the thesis advisor prior to its submission. Students completing the M.S. project option are exempt from the publication requirement. Prior to defending the Ph.D. thesis, the candidate must present at least three peer-reviewed publications. For the Ph.D., the publications must be published or in-press, meaning that they have been fully accepted for publication.

Students who are unfamiliar with guidelines for manuscript authorship should discuss it with their thesis advisor. Authors are individuals who make substantial contributions to the work in terms of conception, design, execution, and/or analysis and interpretation of data and who participate in drafting, reviewing, and/or revising a manuscript for intellectual content. Typically, the first author is the individual who conducts the bulk of the experimental work, analyzes the data, and writes the first draft of the paper. The last author is often the senior author who conceived the project, who coordinates the contributions of co-authors, and who is responsible for the overall content of the final paper. As such, any manuscript that is based on a student's thesis must include the student as a co-author and will typically include the advisor as the senior author.

4.7. PhD Qualifying Exam

Every student enrolled in the Ph.D. program is required to pass a qualifying examination, which is intended to determine whether a student has the necessary background and skills required to successfully complete the degree. Students must complete the exam sequence within three semesters of entering the program. A student's thesis advisor may petition the SOE PhD Committee for a modification of this schedule for extenuating circumstances. Details of the Ph.D. Qualifying Exam are attached in Appendix C.

4.8 Thesis and Oral Defense

Candidates for the Ph.D. degree and the thesis option of the M.S. degree must develop and present a thesis which demonstrates the ability to carry out an original, scientific investigation and to write a scholarly exposition. The research findings presented in the thesis must be unrestricted and available for full public display. The thesis author and research advisor may request that the thesis is withheld from full public display for a period of 12 months to secure intellectual property rights.

The required format for the thesis are available on-line at <http://thesis.alfred.edu/grad/>. The M.S. thesis should be less than 50 pages (excluding graphs and figures). The Ph.D. thesis may be presented as a compilation of stand-alone papers but must include at least two additional chapters -- one that introduces the body of work and one that discusses its significance as a whole. Students electing to present the thesis as a compilation of papers must use the required format specified at <http://thesis.alfred.edu/grad/>.

Student should begin preparing their written thesis well in advance of their expected defense date. Students first submit a draft copy of the thesis to their research advisor and make the necessary revisions in consultation with their advisor. The thesis advisor's approval on the *Thesis Review Form* (Appendix B) signifies that the thesis meets his/her approval and that it can be reviewed by the Thesis Committee. Students then submit copies of the advisor-approved thesis to the thesis-committee members along with a signed copy of the *Thesis Review Form*. As indicated on the form, committee members may refuse to review the thesis in its current form, make recommendations for modifications, or approve the thesis. Students should allow 2-3 weeks for committee review. If a committee member does not provide comments within three weeks, it signifies approval of the thesis. Once approved by the advisor, the thesis should also be submitted to the Secretary of the Graduate Programs to be reviewed for formatting.

The thesis defense may be officially scheduled only after the thesis passes committee review and may occur only after the thesis has been on display for the required length of time (one week for M.S. theses and two weeks for Ph.D. theses). Additionally, the defense may only be held when the university is in session; these dates are specified in the Graduate Catalog and on-line at http://www.alfred.edu/academic_calendar. The student is responsible for working with the committee members to identify a time and date for the thesis. Students should schedule two hours for the thesis defense. The student should notify the Graduate Program Secretary of the time and date of the defense and provide two copies of the thesis for display. The Graduate Program Secretary will identify a chair for the oral defense and announce the defense to the campus community. The Thesis Defense Checklist, available from the Graduate Program Secretary, provides instructions for additional requirements that **MUST** be completed prior, during or after the defense. The degree will be conferred only after all of these requirements are met.

During the oral defense, the candidate will summarize his or her thesis in a formal presentation during an open session followed by a brief question-and-answer session. As a guideline, the candidates should prepare a presentation that is 20 minutes long for the M.S. and 45 minutes long for the Ph.D. A closed session, including only the candidate and faculty, will follow. Non-voting committee members may be invited to attend the closed session with unanimous approval of the voting committee. Unanimous approval of the thesis and oral examination is necessary to fulfill the degree requirement. In the event of a disagreement over the quality of the thesis or the preparation of the candidate, the matter will be settled by the School of Engineering Graduate Committee.

4.9 Project Final Report and Oral Presentation

Candidates for the project option of the M.S. degree must write and present a technical report which demonstrates the ability to complete an independent research or design project. The project option of the M.S. degree is only available to part-time students enrolled in the Electrical Engineering and Mechanical Engineering. An M.S. project is different than an M.S. thesis in that the thesis must include a rigorous survey of existing work and generate new knowledge or significantly improve on existing techniques, whereas as the project may use existing knowledge or techniques to solve an engineering problem. Often M.S. projects can be categorized as design rather than research projects. The candidate for the degree must submit a final written report and defend the work in a presentation meeting to the satisfaction of the project advisory committee. The circulation of the project report may be limited to the advisory committee.

5. Professional Standards of Conduct

Graduate students are expected to behave in a manner that is consistent with the standards of the University and of the engineering and science profession. Graduate students should become familiar with Alfred University's policies regarding such topics as sexual harassment, discrimination, animal control, etc. These policies can be found at the website listed below:

- https://my.alfred.edu/hr/handbooks/dsp_viewsection.cfm?section=141&handbook=1

Students are expected to maintain a safe work environment. Through mandatory and optional safety training, students should familiarize themselves with the policies and procedures related to environmental health and safety. As a reference, the website for AU's office of Environmental Health and Safety can be found at the following website:

- <https://my.alfred.edu/ehs/>

Students are expected to participate in the maintenance of common-use labs and to follow established standard operating procedures, when available. As a general operating principle, student researchers should leave equipment and facilities in a better state than when they

started using them. Equipment and facilities found in an inoperable, damaged, or unsafe state should be reported immediately to the faculty member, technical specialist or student responsible for the equipment. If unintentional damage occurs as a result of the student's use of the common-use facility, he/she should report it to his/her research supervisor so that the supervisor may identify a plan for covering the cost of the repair.

All researchers in the School of Engineering are expected to engage in responsible conduct of research. Within one month of enrolling in the graduate program, students must complete and pass the web-based CITI Responsible Conduct of Research (RCR) course for Engineers or the Physical Science, as appropriate. The on-line course is available at www.citiprogram.org. The Office of Sponsored Research Administration will provide instructions of logging on.

**Appendix A.
Individuals and Committees Responsible
for the Graduate Programs**

University Graduate Programs

Associate Provost and Dean of Graduate Studies: Dr. Nancy Evangelista

Alfred University Graduate Council: Led by the Associate Provost and Dean of Graduate Studies, the Grad Council oversees university-wide policies related to the graduate programs at Alfred University. Membership includes faculty, staff, and students.

School of Engineering Graduate Programs

Dean of Engineering and Graduate Program Director: Dr. Doreen Edwards

Secretary for Graduate Programs: Ms. Katie Decker

SoE Graduate Committee: Faculty involved in SoE graduate education, either as an instructor of graduate courses or as thesis advisor.

Graduate Scholastic Standards Committee: The graduate committee.

Graduate Student Council: Two students (one domestic and one international) elected by the graduate student body to represent graduate student body to graduate committee.

Graduate Admissions Committee: Three to six faculty appointed by the Dean annually. Often faculty who are actively recruiting graduate students.

MS Program Committees: There are six MS program committees, each responsible for the curriculum of one of the six MS programs. The MS programs committees are chaired by the Division Chairs in the School of Engineering. Membership includes faculty with expertise relevant to the individual programs.

PhD Program and Qualifying Exam Committees: The PhD Program Committee, consisting of the faculty thesis-research advisors of current Ph.D. students, is responsible for matters related to the curriculum of the Ph.D. program. Part I of the Qualifying Exam is overseen by the PhD Program Committee and additional faculty who volunteer to evaluate the exam. Part II of the Qualifying Exam is overseen by the Thesis Advisory Committee and two additional faculty appointed by the Dean.

Appendix B.
Summary of Degree Requirements

**M.S. Biomaterials Engineering
Degree Requirements**

Undergraduate Preparation	<ul style="list-style-type: none"> • Four-year degree in physical sciences (including biology) or engineering
Total credit hours	<ul style="list-style-type: none"> • Thirty (30) hours of graduate credit, including 23 credits of coursework and 7 credits of thesis
Transfer Credit	<ul style="list-style-type: none"> • Up to 6 credit hours of relevant graduate work, subject to approval by the Graduate Program Director
Course Work	<p>At least 23 credit hours of course work, including</p> <ul style="list-style-type: none"> • CEMS 568 – Biomedical Materials (3 credits) • CEMS 569 – Advanced Biomedical Materials (3 credits) • CEMS 5xx – Materials Technical Electives (9 credits) • CEMS 5xx – Biology Technical Electives (8 credits) • CEMS 690 – Graduate Seminar (0 credits) each semester of full-time enrollment
Thesis Credits	<p>At least 15 credit hours of thesis, including</p> <ul style="list-style-type: none"> • CEMS 660 – Research seminar (1 credit), preferably taken during the first semester of graduate enrollment • CEMS 680 – Thesis research (6 credits)
Progress Reports	<ul style="list-style-type: none"> • One-page progress report summarizing thesis progress and plans for upcoming semester
Written Thesis and Oral Defense	<ul style="list-style-type: none"> • Written thesis (typically < 50 pages text) meeting approval of thesis advisory committee • Successful oral defense of thesis
Manuscript Requirement	<ul style="list-style-type: none"> • Preparation and submission of at least one manuscript for publication in peer-reviewed journal
Length of Study	<ul style="list-style-type: none"> • Designed to be completed in 24 months (4 semesters plus summers) of full time study • Must be completed within six years of admission* <p><i>*Students must maintain continuous enrollment.</i></p>

Updated: 3/29/2013

**M.S. Ceramic Engineering
Degree Requirements**

Undergraduate Preparation	<ul style="list-style-type: none"> • Four-year degree in accredited engineering program
Total credit hours	<ul style="list-style-type: none"> • Thirty (30) hours of graduate credit, including 15 credits of coursework and 15 credits of thesis
Transfer Credit	<ul style="list-style-type: none"> • Up to 6 credit hours of relevant graduate work, subject to approval by the Graduate Program Director
Course Work	<p>At least 15 credit hours of course work, including</p> <ul style="list-style-type: none"> • CEMS 510 – Advanced Ceramic Processing (3 credits) or CEMS 511 – Science of Whitewares (3 credits) • CEMS 5xx – Characterization Elective (3 credits) • Graduate-level technical electives (9 credits) • CEMS 690 – Graduate seminar (0 credits) each semester of full-time enrollment
Thesis Credits	<p>At least 15 credit hours of thesis, including</p> <ul style="list-style-type: none"> • CEMS 660 – Research seminar (1 credit), preferably taken during the first semester of graduate enrollment • CEMS 680 – Thesis research (14 credits)
Progress Reports	<ul style="list-style-type: none"> • One-page progress report summarizing thesis progress and plans for upcoming semester
Written Thesis and Oral Defense	<ul style="list-style-type: none"> • Written thesis (typically < 50 pages text) meeting approval of thesis advisory committee • Successful oral defense of thesis
Manuscript Requirement	<ul style="list-style-type: none"> • Preparation and submission of at least one manuscript for publication in peer-reviewed journal
Length of Study	<ul style="list-style-type: none"> • Designed to be completed in 16 months (3 semesters plus summer) of full time study • Must be completed within six years of admission* <p><i>*Students must maintain continuous enrollment.</i></p>

Updated 1/24/07

**M.S. Electrical Engineering
Degree Requirements**

Undergraduate Preparation	<ul style="list-style-type: none"> • Four-year degree in approved electrical engineering or physics program
Total Credit Hours	<ul style="list-style-type: none"> • Thirty (30) hours of graduate credit
Transfer Credit	<ul style="list-style-type: none"> • Up to 6 credit hours of relevant graduate work, subject to approval by the Graduate Program Director
Course Work	<p>At least 5 advanced courses, including</p> <ul style="list-style-type: none"> • Advanced math elective (4 credits) • ELEC 5xx –technical electives (4 courses) • CEMS 690 - Graduate seminar (0 credit) if required by thesis advisor or program chair
Thesis or Project Credits	<p>Depends on selected track, as follows:</p> <ul style="list-style-type: none"> • Thesis track: At least 6 credits of ELEC 680 • Project track: At least 3 credits of ELEC 699 • CEMS 660 – Research seminar (1 credit) if required by thesis advisor or program chair
Progress Reports	<ul style="list-style-type: none"> • One-page progress report summarizing thesis progress and plans for upcoming semester
Written Thesis and Oral Defense* <i>* thesis track only</i>	<ul style="list-style-type: none"> • Written thesis (typically < 50 pages text) meeting approval of thesis advisory committee • Successful oral defense of thesis
Manuscript Requirement* <i>* thesis track only</i>	<ul style="list-style-type: none"> • Preparation and submission of at least one manuscript for publication in peer-reviewed journal
Written project report* <i>*project track only</i>	<ul style="list-style-type: none"> • Written technical report meeting approval of project advisor
Length of Study	<ul style="list-style-type: none"> • Within three years of admission for full-time students or within six years of admission for part-time students* <p style="text-align: center;"><i>*Students must maintain continuous enrollment.</i></p>

Updated 1/24/07

**M.S. Glass Engineering Science
Degree Requirements**

Undergraduate Preparation	<ul style="list-style-type: none"> • Four year degree in physical sciences or engineering program
Total credit hours	<ul style="list-style-type: none"> • Thirty (30) hours of graduate credit, including 15 credits of coursework and 15 credits of thesis
Transfer Credit	<ul style="list-style-type: none"> • Up to 6 credit hours of relevant graduate work, subject to approval by the Graduate Program Director
Course Work	<p>At least 15 credit hours of course work, including</p> <ul style="list-style-type: none"> • CEMS 52x – Glass Elective (6 credits) • CEMS 5xx – Characterization Elective (3 credits) • Graduate-level technical electives (6 credits) • CEMS 690 – Graduate seminar (0 credits) each semester of full-time enrollment
Thesis Credits	<p>At least 15 credit hours of thesis, including</p> <ul style="list-style-type: none"> • CEMS 660 – Research seminar (1 credit), preferably taken during the first semester of graduate enrollment • CEMS 680 – Thesis research (14 credits)
Progress Reports	<ul style="list-style-type: none"> • One-page progress report summarizing thesis progress and plans for upcoming semester
Written Thesis and Oral Defense	<ul style="list-style-type: none"> • Written thesis (typically < 50 pages text) meeting approval of thesis advisory committee • Successful oral defense of thesis
Manuscript Requirement	<ul style="list-style-type: none"> • Preparation and submission of at least one manuscript for publication in peer-reviewed journal
Length of Study	<ul style="list-style-type: none"> • Designed to be completed in 16 months (3 semesters plus summer) of full time study • Must be completed within six years of admission* <p><i>*Students must maintain continuous enrollment.</i></p>

Updated 1/24/2007

**M.S. Materials Science and Engineering
Degree Requirements**

Undergraduate Preparation	<ul style="list-style-type: none"> • Four year degree in physical sciences or engineering program
Total credit hours	<ul style="list-style-type: none"> • Thirty (30) hours of graduate credit, including 15 credits of coursework and 15 credits of thesis
Transfer Credit	<ul style="list-style-type: none"> • Up to 6 credit hours of relevant graduate work, subject to approval by the Graduate Program Director
Course Work	<p>At least 15 credit hours of course work, including</p> <ul style="list-style-type: none"> • CEMS 545 – Characterization of Materials (3 credits) • CEMS 503 – Thermodynamics of Materials (3 credits) <p>or</p> <ul style="list-style-type: none"> • CEMS 50X – Solid State Physics • Graduate-level technical electives (9 credits) • CEMS 690 – Graduate seminar (0 credits) each semester of full-time enrollment
Thesis Credits	<p>At least 15 credit hours of thesis, including</p> <ul style="list-style-type: none"> • CEMS 6XX – Research seminar (1 credit), preferably taken during the first semester of graduate enrollment • CEMS 680 – Thesis research (14 credits)
Progress Reports	<ul style="list-style-type: none"> • One-page progress report summarizing thesis progress and plans for upcoming semester
Written Thesis and Oral Defense	<ul style="list-style-type: none"> • Written thesis (typically < 50 pages text) meeting approval of thesis advisory committee • Successful oral defense of thesis
Manuscript Requirement	<ul style="list-style-type: none"> • Preparation and submission of at least one manuscript for publication in peer-reviewed journal
Length of Study	<ul style="list-style-type: none"> • Designed to be completed in 16 months (3 semesters plus summer) of full time study • Must be completed within six years of admission* <p><i>*Students must maintain continuous enrollment.</i></p>

Updated 1/24/2007

**M.S. Mechanical Engineering
Degree Requirements**

Undergraduate Preparation	<ul style="list-style-type: none"> • Four year degree in approved physical science or engineering program* <p>* Students with undergraduate degree outside Mechanical Engineering must satisfy all undergraduate prerequisites for Mechanical Engineering graduate courses.</p>
Total Credit Hours	<ul style="list-style-type: none"> • Thirty (30) hours of graduate credit
Transfer Credit	<ul style="list-style-type: none"> • Up to 6 credit hours of relevant graduate work, subject to approval by the Graduate Program Director
Course Work	<ul style="list-style-type: none"> • At least 24 credits of advanced coursework forming a coherent plan of in-depth study and selected in consultation with the student's advisor or thesis committee • CEMS 690 - Graduate seminar (0 credit) if required by thesis advisor or program chair
Thesis or Project Credits	<p>Depends on selected track, as follows:</p> <ul style="list-style-type: none"> • MECH 680 (6 credits for thesis track) • MECH 699 (3 credits for project track) • CEMS 660 – Research seminar (1 credit) if required by thesis advisor or program chair
Progress Reports	<ul style="list-style-type: none"> • One-page progress report summarizing thesis progress and plans for upcoming semester
Written Thesis and Oral Defense* <i>* thesis track only</i>	<ul style="list-style-type: none"> • Written thesis (typically < 50 pages text) meeting approval of thesis advisory committee • Successful oral defense of thesis
Manuscript Requirement* <i>* thesis track only</i>	<ul style="list-style-type: none"> • Preparation and submission of at least one manuscript for publication in peer-reviewed journal
Written project report* <i>*project track only</i>	<ul style="list-style-type: none"> • Written technical report meeting approval of project advisor
Length of Study	<ul style="list-style-type: none"> • Within three years of admission for full-time students or within six years of admission for part-time students* <p><i>*Students must maintain continuous enrollment.</i></p>

Updated 1/24/2007

**Ph.D. Ceramics
Degree Requirements**

Undergraduate Preparation	<ul style="list-style-type: none"> • Four year degree in physical sciences or engineering
Total credit hours	<ul style="list-style-type: none"> • Ninety (90) hours of graduate credit, including at least 33 hours of coursework and at least 30 hours of thesis credit
Residency requirement	<ul style="list-style-type: none"> • Two years of full-time registration
Transfer Credit	<ul style="list-style-type: none"> • Up to 15 credit hours of relevant graduate work, subject to approval by the Dean of Engineering
Course Work	<p>At least 33 credit hours of course work, including</p> <ul style="list-style-type: none"> • CEMS 501 – Advanced Engineering Math (3 credits) • CEMS 503 – Thermodynamics of Materials (3 credits) • CEMS 504 – Kinetics and Non-equilibrium Processes in Materials (3 credits) • CEMS 506 – Solid State Physics (3 credits) • Graduate-level technical electives (21credits) • ENGR 690 – Graduate seminar (0 credits) each semester of full-time enrollment
Thesis Credits	<p>At least 33 credit hours of thesis, including</p> <ul style="list-style-type: none"> • ENGR 660 – Research seminar (1 credit), preferably taken during the first semester of graduate enrollment • CEMS 680 – Thesis research (32 credits)
Progress Reports	<ul style="list-style-type: none"> • One-page progress report summarizing thesis progress and plans for upcoming semester
Qualifying Exam	<ul style="list-style-type: none"> • Three-hour written exam covering undergraduate-level materials science and engineering* • Successful oral defense of written research proposal* <p><i>* Two attempts allowed. Typically completed within first year of admission.</i></p>
Written Thesis and Oral Defense	<ul style="list-style-type: none"> • Written thesis meeting approval of thesis advisory committee • Successful oral defense of thesis
Manuscript Requirement	<ul style="list-style-type: none"> • Publication of at least three manuscripts in peer-reviewed journals
Length of Study	<ul style="list-style-type: none"> • Designed to be completed in 4.5 years of full-time study after admission with bachelor's degree or in 3 years of full-time study after admission with a master's degree.

Updated 3/15/2013

**Ph.D. Glass
Degree Requirements**

Undergraduate Preparation	<ul style="list-style-type: none"> • Four year degree in physical sciences or engineering
Total credit hours	<ul style="list-style-type: none"> • Ninety (90) hours of graduate credit, including at least 33 hours of coursework and at least 30 hours of thesis credit
Residency requirement	<ul style="list-style-type: none"> • Two years of full-time registration
Transfer Credit	<ul style="list-style-type: none"> • Up to 15 credit hours of relevant graduate work, subject to approval by the Dean of Engineering
Course Work	<p>At least 33 credit hours of course work, including</p> <ul style="list-style-type: none"> • CEMS 501 – Advanced Engineering Math (3 credits) • CEMS 503 – Thermodynamics of Materials (3 credits) • CEMS 504 – Kinetics and Non-equilibrium Processes in Materials (3 credits) • CEMS 506 – Solid State Physics (3 credits) • CEMS 52x – Graduate-level glass electives (15 credits) • Graduate-level technical electives (6 credits) • ENGR 690 – Graduate seminar (0 credits) each semester of full-time enrollment
Thesis Credits	<p>At least 33 credit hours of thesis, including</p> <ul style="list-style-type: none"> • ENGR 660 – Research seminar (1 credit), preferably taken during the first semester of graduate enrollment • CEMS 680 – Thesis research (32 credits)
Progress Reports	<ul style="list-style-type: none"> • One-page progress report summarizing thesis progress and plans for upcoming semester
Qualifying Exam	<ul style="list-style-type: none"> • Three-hour written exam covering undergraduate-level materials science and engineering* • Successful oral defense of written research proposal* <p><i>* Two attempts allowed. Typically completed within first year of admission.</i></p>
Comprehensive Exam	<ul style="list-style-type: none"> • Oral exam covering fundamentals of glass science at the graduate level
Written Thesis and Oral Defense	<ul style="list-style-type: none"> • Written thesis meeting approval of thesis advisory committee • Successful oral defense of thesis
Manuscript Requirement	<ul style="list-style-type: none"> • Presentation of at least three peer-reviewed publications prior to submitting and attempting to defend the thesis
Length of Study	<ul style="list-style-type: none"> • Designed to be completed in 4.5 years of full-time study after admission with bachelor's degree or in 3 years of full-time study after admission with a master's degree.

Updated 3/15/2013

**Ph.D. Materials Science and Engineering
Degree Requirements**

Undergraduate Preparation	<ul style="list-style-type: none"> • Four year degree in physical sciences or engineering
Total credit hours	<ul style="list-style-type: none"> • Ninety (90) hours of graduate credit, including at least 33 hours of coursework and at least 30 hours of thesis credit
Residency requirement	<ul style="list-style-type: none"> • Two years of full-time registration
Transfer Credit	<ul style="list-style-type: none"> • Up to 15 credit hours of relevant graduate work, subject to approval by the Dean of Engineering
Course Work	<p>At least 33 credit hours of course work, including</p> <ul style="list-style-type: none"> • CEMS 501 – Advanced Engineering Math (3 credits) • CEMS 502 – Quantum Physics (3 credits) • CEMS 503 – Thermodynamics of Materials (3 credits) • CEMS 504 – Kinetics and Non-equilibrium Processes in Materials (3 credits) • CEMS 505 – Defects and Defect-related Processes (3 credits) • CEMS 506 – Solid State Physics (3 credits) • CEMS 545 – Characterization of Materials (3 credits) • Graduate-level technical electives (12 credits) • ENGR 690 – Graduate seminar (0 credits) each semester of full-time enrollment
Thesis Credits	<p>At least 33 credit hours of thesis, including</p> <ul style="list-style-type: none"> • ENGR 660 – Research seminar (1 credit), preferably taken during the first semester of graduate enrollment • CEMS 680 – Thesis research (32 credits)
Progress Reports	<ul style="list-style-type: none"> • One-page progress report summarizing thesis progress and plans for upcoming semester
Qualifying Exam	<ul style="list-style-type: none"> • Three-hour written exam covering undergraduate-level materials science and engineering* • Successful oral defense of written research proposal* <p><i>* Two attempts allowed. Typically completed within first year of admission.</i></p>
Written Thesis and Oral Defense	<ul style="list-style-type: none"> • Written thesis meeting approval of thesis advisory committee • Successful oral defense of thesis
Manuscript Requirement	<ul style="list-style-type: none"> • Presentation of at least three peer-reviewed publications prior to submitting and attempting to defend the thesis
Length of Study	<ul style="list-style-type: none"> • Designed to be completed in 4.5 years of full-time study after admission with bachelor's degree or in 3 years of full-time study after admission with a master's degree.

Updated 3/15/2013

**Appendix C.
School of Engineering
Forms**

**Alfred University
School of Engineering
Advisor and Thesis Committee Selection Form**

To be filled out by student:

Student Name: _____ **Student ID Number:** _____

Program: **BME** **Cer/E** **EE** **GS** **MSE** **ME**

Degree Sought: **MS** **PhD**

Program Start Date: **Fall** **Spring** **20__**

Expected Graduation: **Fall** **Spring** **Summer** **20__**

Member Name

Thesis Advisor

Committee Member #2

Committee Member #3

Committee Member #4

To be filled out by advisor and discussed with graduate student:

Anticipated Funding

Duration	Source (Account number or name)	Level of support (full, partial)

Student's Signature: _____ **Date:** _____

Advisor's Signature: _____ **Date:** _____

**Alfred University
School of Engineering
Graduate Student Semester Progress Report**

Directions: Complete form and e-mail to the Graduate Program Secretary (deckerk@alfred.edu)

Name: *(your name here)* Current Semester: *(Spring '15)*

Degree Program: *(e.g. M.S. Cer. Eng.)* Exp. Grad. Date: *(e.g. Fall '18)*

Advisor: *(advisor's name here)*

Thesis Title (or Topic): *(thesis title here)*

Date of Last Committee Meeting: *(indicate date here)*

List major research activities this semester:

- *(Major activity, e.g. prepared research proposal)*
- *(Major activity, e.g. prepared xx samples)*
- *(Major activity, e.g. analyzed xx samples)*

List goals for upcoming semester:

- *(Planned activity, e.g. complete analysis of xx samples)*
- *(Planed activity, e.g. develop model to describe sample behavior)*

List publications, presentations, reports, awards, etc.

- *Y.Y. Ma and M. Davis, "Lattice parameters of doped harmonium oxide", a poster presentation at the 35th Annual Meeting of the Bohemian Materials Society, January 201x*
- *Interim report submitted to sponsor, Feb 201x*
- *Dean's award for public service, May 201x*

**Alfred University
School of Engineering
Graduate Student Assessment Form**

Student _____ Advisor _____

Degree Sought: MS PhD

Field: BME Cer/CerE EE GES MSE ME

Semester (after BS): 1 2 3 4 5 6 7 8 >8

	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	No basis for judgment
Ability to state hypothesis of research project					
Ability to conduct independent research or design project					
Ability to formulate and design a research project (PhD)					
Awareness of the state-of-technology in their field of research					
Ability to critical evaluate information and assess its reliability					
Ability to use tools/techniques needed for completion of project					
Ability to design and carry out experiments					
Ability to design a system, component, process to meet project needs					
Ability to analyze and interpret data					
Ability to communicate effectively (oral)					
Ability to communicate effectively (written)					
Understanding of professional responsibility					

SoE - Grad Programs Form 3 (updated 4/1/2013)

**School of Engineering
Thesis Review Form**

Directions for student: Complete this section of the form and obtain your advisor's signature. Submit a photocopy of the signed form along with the copy of your thesis to each of your thesis-committee members.

Student Name: _____ Projected Defense Date: _____

I've read the attached thesis and approve it for review by the thesis committee.

Thesis Advisor: _____ Date: _____

Directions to thesis committee members: Check the appropriate box(es) and return this form and the reviewed manuscript to the student within 2 weeks of the submission date. Failure to provide comments within 3 weeks signifies acceptance of thesis.

- The draft manuscript will not be reviewed in its present form.
 - Sections, figures, and /or tables are missing.
 - The manuscript contains numerous formatting, spelling, and/or grammar errors that preclude review of its technical content.
 - Major revisions are required as noted in the draft manuscript.
 - Minor revisions are required as noted in the draft manuscript.
 - No revisions are required.
-
-

- I am withholding my approval of the written thesis at this time. I wish to review and approve the corrected thesis before it is put on display. *(Do not sign below)*
 - I do not wish to review the corrected thesis before it is put on display. Providing that the student adequately addresses the editorial comments I have made, I approve the written thesis for display. *(Sign below)*
-
-

Thesis committee member

Date

**School of Engineering
Graduate Thesis Assessment Form**

Degree: MS PhD Incoming Degree: BS MS
 Area: BME Cer/CerE EE Glass ME MSE
 Semesters of Study: _____ GPA: _____

Please rank student with regard to expectations for the degree:

	Did not meet	Met	Exceeded
Knowledge of field			
Ability to conduct independent project			
Ability to design experiments			
Understanding of professional responsibility			

Please rank written thesis:

	Poor	Acceptable	Excellent
Overall presentation (non-technical)			
Organization and clarity			
Scope and context of research project (including hypothesis)			
Literature review			
Presentation and discussion of experimental procedures			
Presentation and discussion of data and its analysis			
Quality of data, treatment of error			
Interpretation of data			
Conclusions and future work			

Please rank oral defense thesis:

	Poor	Acceptable	Excellent
Overall presentation (professional?)			
Clarity and organization			
Quality of graphics			
Response to questions			

of publications: ___ Published or in press ___ Submitted ___ In Preparation

of professional presentations: ___ Oral ___ Poster

Chair:

Committee:

**Appendix D.
School of Engineering
Ph.D. Qualifying Exam**

Ph.D. Qualifying Exam

Every student enrolled in the Ph.D. program is required to pass a qualifying examination, which is intended to determine whether a student has the necessary background and skills required to successfully complete the degree.

A. Exam Details

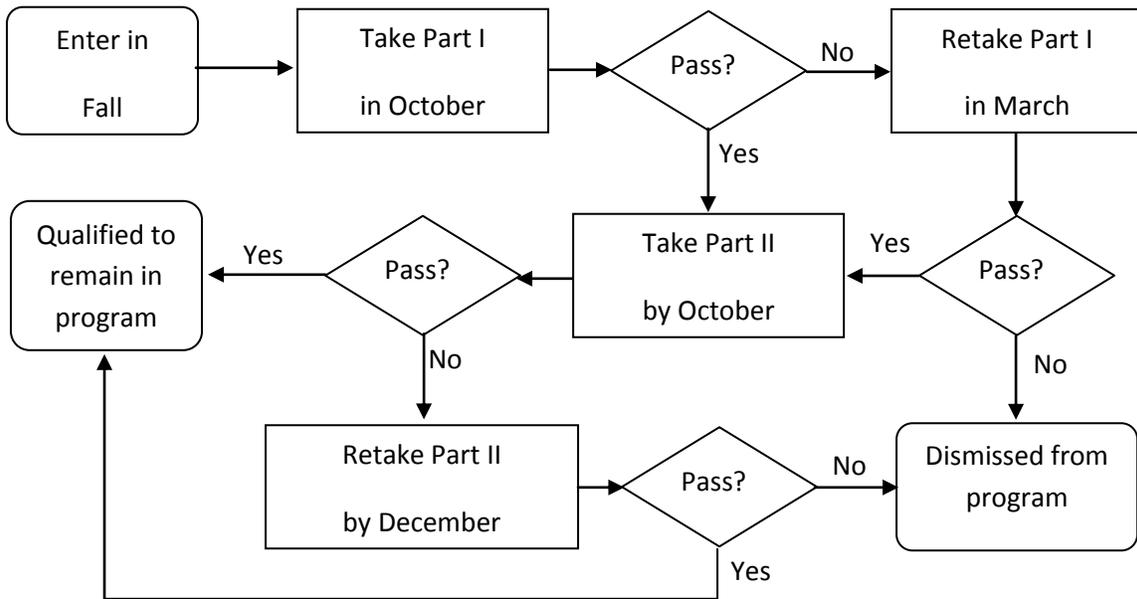
The Ph.D. qualifying exam has two parts, described below:

- Part I is a three-hour written exam covering mathematics, chemistry, physics, and the fundamentals of materials science and engineering. The exam format may include multiple choice questions, short answer questions, and long-answer questions. A list of suggested study materials is provided in Section C of this document. The exam is offered in October and March. Students are required to attempt the exam at the first possible opportunity after admission. Students entering in the spring semester will be offered two attempts during the first March and April following their admission. The exam will be graded pass-fail.
- Part II of the exam consists of a proposal, presentation, and oral examination. Students are required to prepare an original written proposal describing their research project and to present the proposal to a committee comprised of student's thesis committee and at least two additional faculty members appointed by the Ph.D. qualifying committee. After the student's presentation, the committee will conduct an oral examination covering material relevant to the proposed research. Details regarding the proposal and presentation are provided in Section D of this document. The exam will be graded pass-fail. Students will be provided two attempts at this exam, both of which must be completed 9 months after admission into the Ph.D. program. As a guideline, students entering in the fall semester should schedule their oral exam for the first February following their admission, and those entering in spring should schedule their exam for the first June following their admission.

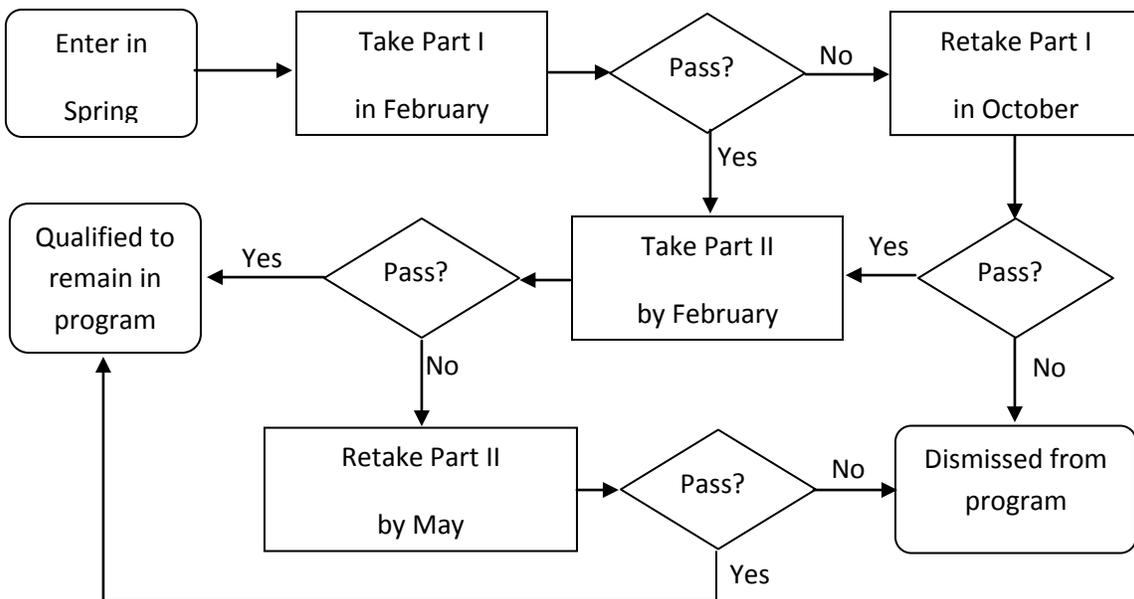
B. Exam Schedule

On the following page are flow charts that illustrate the normal exam sequence for students entering the program in fall and in spring semesters, respectively. Students will typically complete the exam sequence within nine months of entering the program. A student's thesis advisor may petition the SOE Graduate Program Director for a modification of this schedule for extenuating circumstances.

Flow Chart for Students Entering the PhD Program in the Fall Semester



Flow Chart for Students Entering the PhD Program in the Spring Semester



C. List of Resources

Part I of the qualifying exam will cover mathematics, chemistry, physics, and the fundamentals of materials science and engineering at a level presented in the common curriculum of undergraduate degrees in Ceramic Engineering, Glass Engineering Science, and Materials Science and Engineering at Alfred University. In addition to standard college texts covering chemistry, math, and physics, the following textbooks are recommended reference materials.

M. F. Ashby and D.R. H. Jones: *Engineering Materials 1-An Introduction to their Properties and Applications*. (ISBN: 0750630817).

C. G. Bergeron and S. H. Risbud, *Introduction to Phase Equilibria in Ceramics*, (ISBN: 0-916094-58-8).

W. D. Callister, Jr., *Materials Science and Engineering: An Introduction*, (ISBN: 0-471-13576-3).

B. D. Cullity, *Elements of X-ray Diffraction*, (ASIN: 0201011743).

R. T. DeHoff, *Thermodynamics in Materials Science*, (ASIN: 0070163138).

R. C. Hibbeler, *Mechanics of Materials*, (ISBN: 0130081817).

L. E. Jones, *CES 307 Thermal and Mechanical Properties of Materials Study Guide*.

J. D. Livingston, *Electronic Properties of Engineering Materials*, (ISBN: 0-471-31627-X).

D. V. Ragone, *Thermodynamics of Materials, Volume I and II*, (ISBN: 0471141704).

J. F. Shackelford, *Introduction to Materials Science for Engineers*, (ISBN: 0130112879).

J. P. Sibilio, *A Guide to Materials Characterization and Chemical Analysis*, (ISBN: 0471186333)

L. Solymar and D. Walsh, *Electrical Properties of Materials*, (ISBN: 0198562721).

J. R. Varner and W. E. Votava, *Microscopy and Microstructural Characterization Lecture Notes*, (contains additional references)

D. Proposal and Presentation Format

Part II of the exam involves writing and presenting a research proposal. The written proposal should be ≤15 pages long, double spaced, (excluding references) and contain the following sections:

- Project Overview – a summary of the proposed project (≤1 page)
- Introduction – a brief discussion describing why the research is being conducted (≤1 page)
- Literature Review – a focused review of the literature that is relevant to the project (≤ 8 pages)
- Preliminary Results (if applicable) – a presentation of any preliminary results
- Work Plan and Schedule – a description the proposed work broken down into tasks and subtasks and a proposed schedule for the project (≤ 3 pages)
- Budget – a table summarizing the cost of the project including salary, tuition, supplies, travel, etc.
- Safety and Waste Disposal – a brief description of any safety concerns and plans for hazardous waste disposal (≤1 page)
- References – a list of references (not included in the 15 page limit)

While the student's proposed research may be based on proposal written by the thesis advisor, the student's proposal must be written in the student's own words and must cite the original proposal as a reference when appropriate. The committee may request that the advisor provide a copy of the original proposal if there is concern regarding the originality of the student's proposal.

The written proposal should be submitted to the oral-exam committee at least two weeks before the scheduled exam. At the scheduled exam, students will make a ~20 minute presentation of their proposed research. After the presentation, committee members will conduct an oral examination covering material relevant to the proposed research.