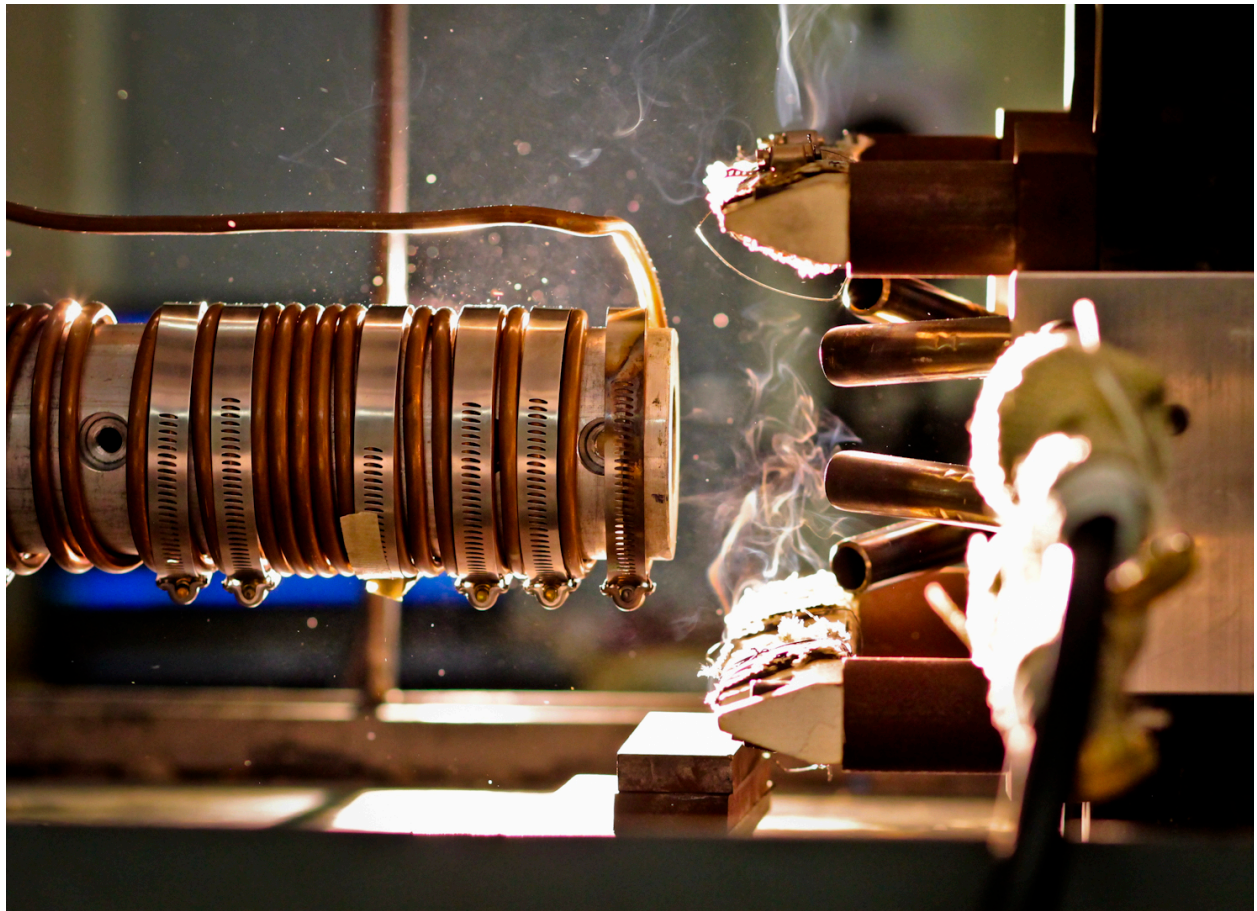


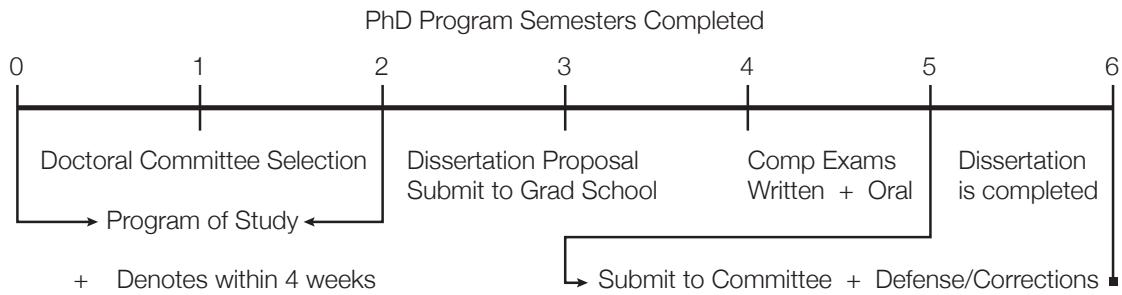
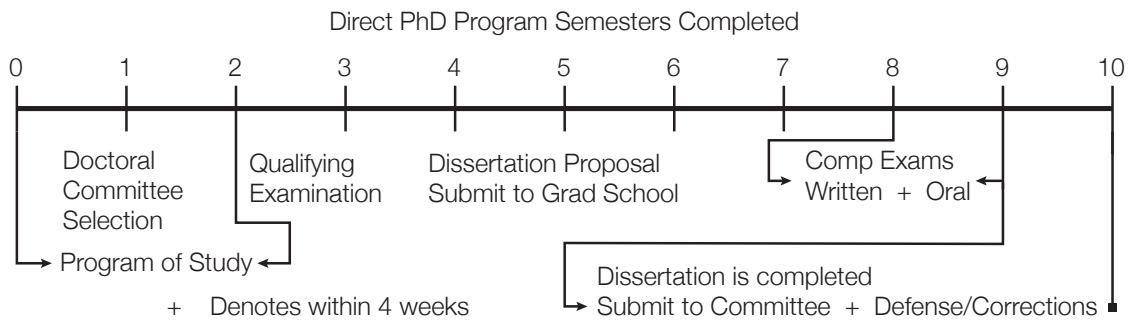
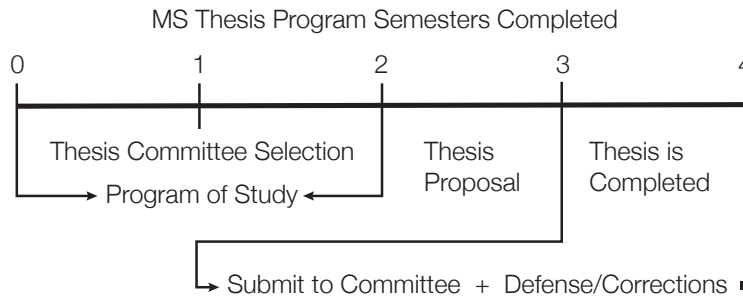
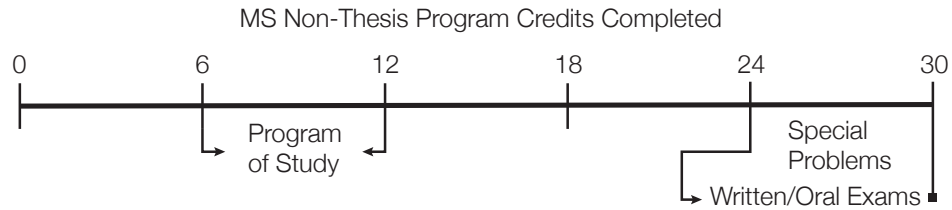
THE
UNIVERSITY
OF RHODE ISLAND



Graduate Student Guide

Prepared by David Chelidze
Spring 2019

DEPARTMENT OF MECHANICAL, INDUSTRIAL AND SYSTEMS ENGINEERING



AN INTRODUCTORY NOTE

Welcome to the Department of Mechanical, Industrial and Systems Engineering! As you work toward a graduate degree in our department, we hope to provide a stimulating, challenging, and supportive environment that will nurture your success. Our department offers programs leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees. Our Masters programs include an M.S. in Mechanical Engineering and Applied Mechanics and an M.S. in Systems Engineering. Each of these degree programs includes both thesis and non-thesis options. Our doctoral program includes both the Mechanical Engineering and Applied Mechanics, and Industrial and Systems Engineering tracks. Mechanical Engineering and Applied Mechanics students normally develop programs of study in fluid dynamics, solid mechanics, thermal science, or mechanical systems. Industrial and Systems Engineering students commonly pursue programs in optimization, transportation, logistics, and the design and operation of manufacturing and healthcare systems. In addition, there are opportunities for interdisciplinary programs involving other departments both within, and outside of, the College of Engineering.

You should select a major professor (sometimes referred to as an advisor) as soon as possible to aid in your course selection, guide you in your research, and provide general help in all aspects of your academic work. If you do not have an advisor, it is imperative to contact the graduate studies director to advise and help you to procure one. Your major professor will work closely with you during your entire graduate program, and although he or she will provide help with navigating the rules associated with your degree program, the ultimate responsibility for making sure all requirements are met, lies with you, the student. It is, therefore, important to monitor your program and keep in touch with the Graduate School especially with respect to deadlines and the mandatory paperwork related to your activities.

As a department, we congratulate you, welcome you, and wish you the greatest success in your graduate studies.

Professor David Chelidze
Director of Graduate Studies

PURPOSE OF THIS GUIDE

This guide has been written for graduate students and faculty in order to provide specific information concerning the requirements and procedures related to graduate degrees in the Department of Mechanical, Industrial and Systems Engineering at the University of Rhode Island. The information provided in this guide is meant to supplement the more general and comprehensive information found in the *Graduate Manual* available at <https://web.uri.edu/graduate-manual/>. The required forms can also be downloaded or filled out at the Graduate School web site at <https://web.uri.edu/graduate-school/forms/>. Information covered in our guide primarily involves items that are specific to the department. No attempt has been made here to cover all requirements and procedures for graduate degrees. Careful attention to the details set forth in both this guide and the Graduate Manual will help you avoid delays and any unnecessary issues in completing your degree program. It should be noted that additional material is available on the department web site <https://web.uri.edu/mcise/> describing our special off-campus graduate programs at Raytheon Corporation and Electric Boat, our Dual-Degree Graduate Programs with the Technical University Braunschweig (Germany), and part-time studies.

Some Useful Links:

Graduate Manual: <https://web.uri.edu/graduate-manual/>

Forms: <https://web.uri.edu/graduate-school/forms/>

Deadlines: <https://web.uri.edu/graduate-school/academics/academic-calendar/>

Catalog: <https://web.uri.edu/catalog/graduate-degree-program-descriptions/>

Enrollment Services: <https://web.uri.edu/enrollment/>

Academic Calendars: <https://web.uri.edu/enrollment/academic-calendars/>

Graduate Student Association: <https://web.uri.edu/gsa/>

Graduate Students United: <https://www.urigau.org/>

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MASTER OF SCIENCE IN MECHANICAL ENGINEERING AND APPLIED MECHANICS

Thesis Option

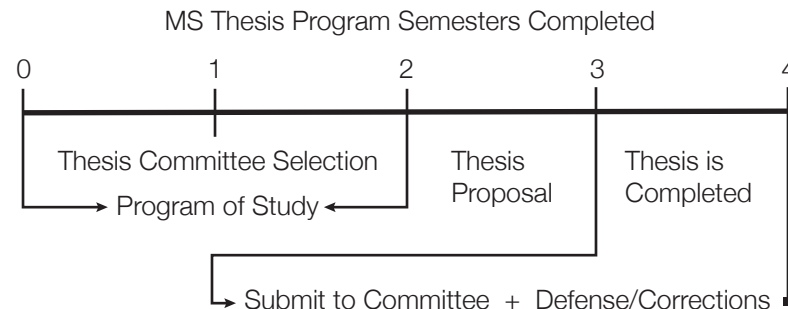


Figure 1: A Brief Timeline for M.S. — Thesis Option

Timeline

It usually takes 2 years to complete an M.S. degree. However, Graduate School allows up to 5 years, not including Leaves of Absence approved by the Graduate School, to complete your M.S. degree. You would also be required to maintain continuous registration until you receive your degree.

Course Work Requirements

Minimum course work requirements vary between 21-24 credit hours (7-8 3-credit courses) depending on whether 6 or 9 credits of thesis research activity are selected. Only 9 credits of 400-level course work are allowed. Additional course work may be required for specific students to compensate for any academic deficiencies identified during their admission to the program. Within their program of study, students must take one distinct course from each of the three department *core areas* (courses cross-listed in two areas can be used for only one of the core areas):

Fluid Mechanics/Thermal Sciences

EGR 515: Hydrodynamics

MCE 541: Advanced Thermodynamics I

MCE 552: Advanced Experimental Methods

MCE 545: Heat Transfer

MCE 546: Convection Heat Transfer

MCE 550: Continuum Mechanics

MCE 551: Fluid Mechanics I

MCE 552: Advanced Experimental Methods

MCE 562: Computational Methods in Fluid Flow and Heat Transfer

MCE 580: Micro/Nanoscale Energy Transport

MCE 653: Fluid Mechanics II

Solid Mechanics

MCE 550: Continuum Mechanics

MCE 552: Advanced Experimental Methods

MCE 561: Computational Methods in Solid Mechanics

MCE 565: Wave Motion and Vibrations of Continuous Media

MCE 568: Theory of Plates

MCE 571: Theory of Elasticity I

MCE 576: Fracture Mechanics

MCE 671: Theory of Elasticity II

MCE 678: Micromechanics

MCE 679: Theory of Plasticity

MCE 680: Advanced Topics in Solid Mechanics

Mechanical Systems

MCE 503: Linear Control Systems

MCE 504: Optimal Control Theory

MCE 523: Advanced Kinematics I

MCE 530: Real-Time Monitoring and Control

MCE 538: Mechanical Engineering Systems

MCE 549: Advanced Product Design for Manufacture

MCE 563: Advanced Dynamics

MCE 564: Advanced Vibrations

MCE 566: The Mechanics of Robot Manipulators

MCE 567: Experimental Nonlinear Dynamics

MCE 663: Nonlinear Dynamics

Graduate Seminar Registration and Attendance Requirement

All full-time students are required to register for and attend Graduate Seminar courses (MCE 501/502) each semester of their residency.

Petitioning

Under special circumstances, appropriate courses that are not on the list may be petitioned for use as a core requirement. Email petitions are preferable. The department graduate committee will evaluate such requests.

Program of Study

A **program of study form**, signed by the student, major professor, and the Graduate Program Director or Department Chair, should be completed and submitted to the Dean of the Graduate School by all students after completing one semester of full-time study. It is ideal to complete one's program of study as soon as possible, and no later than the end of the second semester.

Thesis Requirement

A thesis is *required* for all full-time and thesis-option, part-time students. A total of 6-9 credit hours under MCE 599 are accepted for the thesis research program; however, additional credits may also be taken appropriate to any remaining research to be completed. The number of credit hours given each semester is variable and is determined in consultation with the major professor. It should be understood that the 9-credit thesis represents a body of work that is to be proportionally larger than the usual 6-credit thesis. Because of their full-time work requirements, it is commonly expected that part-time students will do a 6-credit thesis.

Thesis Committee and Thesis Proposal

A *thesis committee* consisting of at least three faculty members (including the major professor) must be established for each student. One member of this committee must be from another department. **Establishment of a graduate program committee form** is used to finalize your selection. Before beginning research activity, a *thesis proposal* must be prepared and should outline the proposed research. The thesis proposal is approved by the major professor and the thesis committee before it is submitted to the graduate school using **proposal approval form**.

Thesis and Oral Defense

A **written thesis document** and a formal thesis defense are required. The thesis document must demonstrate a student's ability to report research in a concise, academic format. For requirements and instructions regarding the **specific format and expectations for written theses**, please consult sections **11.12-11.16** in the *Graduate School Manual*. The oral defense of one's thesis (to schedule defense one needs to file a **request to schedule an oral defense form**) is a two-hour examination to be approved by the thesis defense committee and reported on **the results of MS oral exam form**. If any corrections to the thesis were required, you need to also submit **the certification that corrections were made form**.

Nomination to Graduate

During the final semester, the major professor must prepare and submit a **nomination to graduate form** for a student to graduate that semester.

Non-Thesis Option

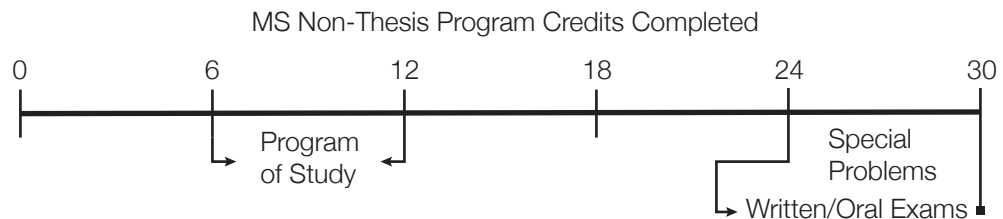


Figure 2: A Brief Timeline for M.S. — Non-Thesis Option

Timeline

It usually takes 2 years to complete an M.S. degree. However, Graduate School allows up to 5 years, not including Leaves of Absence approved by the Graduate School, to complete your M.S. degree. You would also be required to maintain continuous registration until you receive your degree.

Eligibility

Only part-time, off-campus students will be eligible for the non-thesis option and they should normally apply for the option at the time they are applying admission to the graduate program. No thesis committee is required for students in this category. Students enrolled in the non-thesis program will have an advisor to aid in course selection, be the instructor for the special problems class, and administer the written and oral comprehensive examinations (see below).

Course Work Requirements

A total of 30 credit hours (10 courses) must be completed. Only 9 credits (3 courses) of 400-level course work are allowed. Additional course work may be required for specific students to compensate for any academic deficiencies identified during their admission to the program. Within their program of study, students must take one distinct course from each of the three department *core areas* (courses cross-listed in two areas can be used for only one of the core areas):

Fluid Mechanics/Thermal Sciences

EGR 515: Hydrodynamics

MCE 541: Advanced Thermodynamics I

MCE 552: Advanced Experimental Methods

MCE 545: Heat Transfer

MCE 546: Convection Heat Transfer

MCE 550: Continuum Mechanics

MCE 551: Fluid Mechanics I

MCE 552: Advanced Experimental Methods

MCE 562: Computational Methods in Fluid Flow and Heat Transfer

MCE 580: Micro/Nanoscale Energy Transport

MCE 653: Fluid Mechanics II

Solid Mechanics

MCE 550: Continuum Mechanics

MCE 552: Advanced Experimental Methods

MCE 561: Computational Methods in Solid Mechanics

MCE 565: Wave Motion and Vibrations of Continuous Media

MCE 568: Theory of Plates

MCE 571: Theory of Elasticity I

MCE 576: Fracture Mechanics

MCE 671: Theory of Elasticity II

MCE 678: Micromechanics

MCE 679: Theory of Plasticity

MCE 680: Advanced Topics in Solid Mechanics

Mechanical Systems

MCE 503: Linear Control Systems

MCE 504: Optimal Control Theory

MCE 523: Advanced Kinematics I

MCE 530: Real-Time Monitoring and Control

MCE 538: Mechanical Engineering Systems

MCE 549: Advanced Product Design for Manufacture

MCE 563: Advanced Dynamics

MCE 564: Advanced Vibrations

MCE 566: The Mechanics of Robot Manipulators

MCE 567: Experimental Nonlinear Dynamics

MCE 663: Nonlinear Dynamics

One three-credit course must also be taken under *MCE 591/92, Special Problems*. This course is to be taught by the student's advisor and will consist of independent study related to the student's major area. Results from the special problems course will be a written paper and an oral presentation of the findings.

Petitioning

Under special circumstances, appropriate courses that are not on the list may be petitioned for use as a core requirement. Email petitions are preferable. The department graduate committee will evaluate such requests.

Program of Study

A **program of study form**, signed by the student, major professor, and the Graduate Program Director or department chair, should be completed and submitted to the Dean of the Graduate School by all students after completing or 6-9 credits of part-time study. It is ideal to complete one's program of study as soon as possible, and before completing 12 credits of study.

Comprehensive Master's Examination

At or near the end of completion of one's course work, non-thesis master's degree candidates must take their *Special Problems* course and successfully pass a written and oral master's comprehensive examination integrated at its end.

Written Examination

The written exam will be the document that results from the course study and is to be independently developed by the student. The document should be comprehensive in nature and must draw on other course work and subject matter from the student's program of study. However, as it is to be the result of a single semester's study, it should not be of the length and breadth of a master's thesis. The paper should contain the usual sections of a technical report such as Title Page, Abstract, Table of Contents, Introduction, Literature Review, Problem(s) Studied, Results and Conclusions, References. It should use 10 or 12-point font with double spacing and follow the general layout format required for theses (please consult sections 11.12-11.16 in the *Graduate School Manual*). Specific questions concerning the contents of one's paper should be discussed with the student's advisor, and an example paper is available on our website at <https://web.uri.edu/mcise/resources/>. The results of the written exam are communicated to the graduate school using [this form](#).

Oral Examination

The oral exam shall consist of a presentation and defense of the student's written paper. The presentation should be approximately 20 minutes, followed by a committee questioning period not to exceed one hour. The results of the oral exam are communicated to the graduate school using [this form](#).

Evaluation Committee

Both the written and oral examinations will be evaluated by a *three-person committee* composed of the student's advisor, one member from the Department's Graduate Committee, and one additional member selected from the general faculty whose background matches the student's major area of study. The advisor (in consultation with the department's Graduate Studies Director) shall be responsible for selecting the evaluation committee and handling all other administrative issues related to conducting these examinations.

Based on the review of both written and oral portions, the committee shall make a pass/fail decision at the end of the oral exam and immediately report the results to the student and Graduate School. In the event of failure, the student will receive an incomplete grade in the course and re-examination procedures outlined in [section 7.45](#) of the *Graduate School Manual* will be followed.

The time schedule for the special problems course should allow for: the early establishment of the review committee, the completion of the written paper approximately one week before the scheduled oral presentation, and the completion of all comprehensive exam steps to allow for submission of the results

before the semester deadline established by the Graduate School. Note that this deadline may occur before the end of the semester.

Nomination to Graduate

During the final semester, the major professor must prepare and submit a **nomination to graduate form** for a student to graduate that semester.

MASTER OF SCIENCE IN SYSTEMS ENGINEERING

Thesis Option

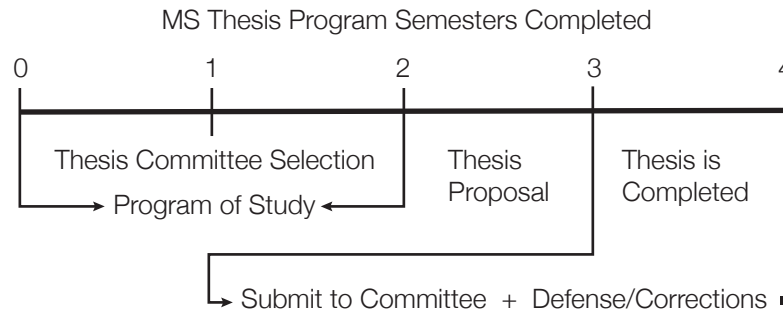


Figure 3: A Brief Timeline for M.S. — Thesis Option

Timeline

It usually takes 2 years to complete an M.S. degree. However, Graduate School allows up to 5 years, not including Leaves of Absence approved by the Graduate School, to complete your M.S. degree. You would also be required to maintain continuous registration until you receive your degree.

Course Work Requirements

Minimum course work requirements vary between 21-24 credit hours (7-8 3-credit courses) depending on whether 6 or 9 credits of thesis research activity are selected. Only 9 credits of 400-level course work are allowed. Additional course work may be required for specific students to compensate for any academic deficiencies identified during their admission to the program. Within their program of study, students must take 2 *core courses* and at least 3 additional courses from the graduate courses offered by the ISE Department. The list is as follows:

Core Courses (Compulsory)

ISE 533 Advanced Statistical Methods
ISE 555 Deterministic Systems Optimization

Additional Courses (At least 3)

ISE500 Project Planning and Management
ISE513 Quality Systems
ISE525 Systems Simulation
ISE540 Production and Inventory Systems
ISE545 Manufacturing Systems
ISE549 Advanced Product Design for Manufacturing
ISE552 Lean Systems
ISE634 Design and Analysis of Experiments
ISE660 Nonlinear Systems Optimization

Up to two courses from the undergraduate program at the 400-level can also be taken for credit in the graduate program. Permission for these must be obtained from the department/major professor individually.

Petitioning

Under special circumstances, appropriate courses that are not on the list may be petitioned for use as a core requirement. Email petitions are preferable. The department graduate committee will evaluate such requests.

Program of Study

A **program of study form**, signed by the student, major professor, and the Graduate Program Director or Department Chair, should be completed and submitted to the Dean of the Graduate School by all students after completing one semester of full-time study. It is ideal to complete one's program of study as soon as possible, and no later than the end of the second semester.

Thesis Requirement

A thesis is *required* for all full-time and thesis-option, part-time students. A total of 6-9 credit hours under ISE 599 are accepted for the thesis research program; however, additional credits may also be taken appropriate to any remaining research to be completed. The number of credit hours given each semester is variable and is determined in consultation with the major professor. It should be understood that the 9-credit thesis represents a body of work that is to be proportionally larger than the usual 6-credit thesis. Because of their full-time work requirements, it is expected that part-time students will do a 6-credit thesis.

Thesis Committee and Thesis Proposal

A *thesis committee* consisting of at least three faculty members (including the major professor) must be established for each student. One member of this committee must be from another department. **Establishment of a graduate program committee form** is used to finalize your selection. Before beginning research activity, a *thesis proposal* must be prepared and should outline the proposed research. The thesis proposal is approved by the major professor and the thesis committee before it is submitted to the graduate school using **proposal approval form**.

Thesis and Oral Defense

A **written thesis document** and a formal thesis defense are required. The thesis document must demonstrate a student's ability to report research in a concise, academic format. For requirements and instructions regarding the **specific format and expectations for written theses**, please consult sections **11.12-11.16** in the *Graduate School Manual*. The oral defense of one's thesis (to schedule defense one needs to file a **request to schedule an oral defense form**) is a two-hour examination to be approved by the thesis defense committee and reported on **the results of MS oral exam form**. If any corrections to the thesis were required, you need to also submit **the certification that corrections were made form**.

Nomination to Graduate

During the final semester, the major professor must prepare and submit a **nomination to graduate form** for a student to graduate that semester.

Non-Thesis Option

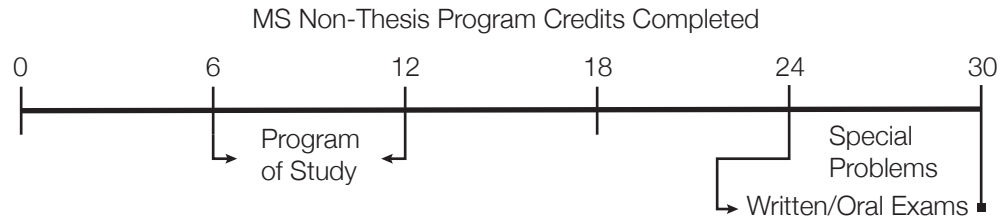


Figure 4: A Brief Timeline for M.S. — Non-Thesis Option

Timeline

It usually takes 2 years to complete an M.S. degree. However, Graduate School allows up to 5 years, not including Leaves of Absence approved by the Graduate School, to complete your M.S. degree. You would also be required to maintain continuous registration until you receive your degree.

Eligibility

The non-thesis option is available to part-time, off-campus students, or in exceptional circumstances, to students with permission from the graduate studies committee. Students should normally apply for the option at the time they are applying admission to the graduate program. No thesis committee is required for students in this category. Students enrolled in the non-thesis program will have an advisor to aid in course selection, be the instructor for the special problems class, and administer the written and oral comprehensive examinations (see below).

Course Work Requirements

A total of 30 credit hours (10 courses) must be completed. Only 9 credits (3 courses) of 400-level course work are allowed. Additional course work may be required for specific students to compensate for any academic deficiencies identified during their admission to the program. Within their program of study, students must take one course from each of the three department *core areas*:

Core Courses (Compulsory)

ISE 533 Advanced Statistical Methods

ISE 555 Deterministic Systems Optimization

Additional Courses (At least 3)

ISE500 Project Planning and Management

ISE513 Quality Systems

ISE525 Systems Simulation

ISE540 Production and Inventory Systems

ISE545 Manufacturing Systems

ISE549 Advanced Product Design for Manufacturing

ISE552 Lean Systems

ISE634 Design and Analysis of Experiments

ISE660 Nonlinear Systems Optimization

One three-credit course must also be taken under *ISE 591/92, Special Problems*. This course is to be taught by the student's advisor and will consist of independent study related to the student's major area. Results from the special problems course will be a written paper and an oral presentation of the findings.

Petitioning

Under special circumstances, appropriate courses that are not on the list may be petitioned for use as a core requirement. Email petitions are preferable. The department graduate committee will evaluate such requests.

Program of Study

A **program of study form**, signed by the student, major professor, and the Graduate Program Director or department chair, should be completed and submitted to the Dean of the Graduate School by all students after completing or 6-9 credits of part-time study. It is ideal to complete one's program of study as soon as possible, and before completing 12 credits of study.

Comprehensive Master's Examination

At or near the end of completion of one's course work, non-thesis master's degree candidates must take their *Special Problems* course and successfully pass a written and oral master's comprehensive examination integrated at its end.

Written Examination

The written exam will be the document that results from the course study and is to be independently developed by the student. The document should be comprehensive in nature and must draw on other course work and subject matter from the student's program of study. However, as it is to be the result of a single semester's study, it should not be of the length and breadth of a master's thesis. The paper should contain the usual sections of a technical report such as Title Page, Abstract, Table of Contents, Introduction, Literature Review, Problem(s) Studied, Results and Conclusions, References. It should use 10 or 12-point font with double spacing and follow the general layout format required for theses (please consult sections 11.12-11.16 in the *Graduate School Manual*). Specific questions concerning the contents of one's paper should be discussed with the student's advisor, and an example paper is available on our website at <https://web.uri.edu/mcise/resources/>. The results of the written exam are communicated to the graduate school using **this form**.

Oral Examination

The oral exam shall consist of a presentation and defense of the student's written paper. The presentation should be approximately 20 minutes, followed by a committee questioning period not to exceed one hour. The results of the oral exam are communicated to the graduate school using **this form**.

Evaluation Committee

Both the written and oral examinations will be evaluated by a *three-person committee* composed of the student's advisor, one member from the Department's

Graduate Committee, and one additional member selected from the general faculty whose background matches the student's major area of study. The advisor (in consultation with the department's Graduate Studies Director) shall be responsible for selecting the evaluation committee and handling all other administrative issues related to conducting these examinations.

Based on the review of both written and oral portions, the committee shall make a pass/fail decision at the end of the oral exam and immediately report the results to the student and Graduate School. In the event of failure, the student will receive an incomplete grade in the course and re-examination procedures outlined in **section 7.45** of the *Graduate School Manual* will be followed.

The time schedule for the special problems course should allow for: the early establishment of the review committee, the completion of the written paper approximately one week before the scheduled oral presentation, and the completion of all comprehensive exam steps to allow for submission of the results before the semester deadline established by the Graduate School. Note that this deadline may occur before the end of the semester.

Nomination to Graduate

During the final semester, the major professor must prepare and submit a **nomination to graduate form** for a student to graduate that semester.

DOCTORAL DEGREES IN MECHANICAL, INDUSTRIAL AND SYSTEMS ENGINEERING

Requirements for Students with M.S. Degree

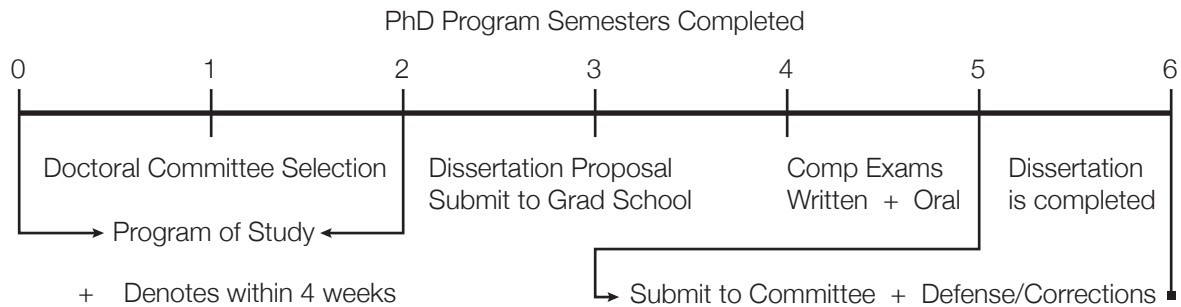


Figure 5: Requirements Timeline for a PhD Degree

The Department offers a common doctoral degree with two separate tracks in ***Mechanical Engineering and Applied Mechanics*** and ***Industrial and Systems Engineering***. The basic requirements for each track are identical unless indicated explicitly as described below.

Timeline

It usually takes 3 years to complete a Ph.D. degree for students with an M.S. degree. However, Graduate School allows up to 7 years, not including Leaves of Absence approved by the Graduate School, to complete your Ph.D. degree. You are also required to maintain continuous registration until you receive your degree.

Course Work Requirements

A minimum of 24 credit hours of course work beyond the Master's degree (exclusive of the graduate seminar for mechanical engineering students) are required. All full-time *mechanical engineering* students are required to register for and attend the Graduate Seminar courses, MCE 501/502 during each semester of residency. Additional course work may also be required as a result of admission conditions and/or candidacy review (see below). A minimum of 18 credits (6 courses) of one's doctoral dissertation are to be taken under MCE/ISE 699.

Doctoral Committee Selection

A doctoral committee must be established for each Ph.D. candidate. This committee must consist of at least three faculty members (including the major professor), one member of which must be from another department. This committee should be selected after the first semester of full-time course work (or after 6-9 credits of part-time study), and will supervise the candidate's entire program of study. **Establishment of a doctoral committee form** needs to be filed with the Dean of the Graduate School.

Program of Study

A doctoral **program of study form**, signed by the student, major professor, and the Graduate Program Director or department chair, should be completed (electronic form is preferred) and submitted to the Dean of the Graduate School by all students after completing one semester of full-time study (or 6-9 credits of part-time study). It is ideal to complete one's doctoral program of study as soon as possible, and no later than the end of the second semester.

Dissertation Proposal

A **dissertation proposal**, which is required for all doctoral students, must serve to concisely and clearly describe a problem that will be investigated through research, as well as how this research will be performed and reported. The proposal should be submitted before any substantial research has been completed, and at least one semester before the semester in which the dissertation is submitted (usually during the first or second semester in which students register for research credits). The proposal should be approved by the major professor and the doctoral committee before submittal to the graduate school using the **dissertation proposal approval form**. For details concerning format requirements for the proposal, please consult **section 7.56** in the *Graduate School Manual online*.

Comprehensive Examination

All Ph.D. candidates must take and pass a comprehensive examination that is normally administered after the student's dissertation proposal has been approved (typically during the final semester of course work or during the semester following). The examination will consist of the following two components:

Written Component

The written portion of the comprehensive exam will be a detailed research proposal that will outline the student's anticipated dissertation work. The document will also address future work and will contain the following sections:

1. *Comprehensive Literature Review of the Research Area.*
2. *Formulation of the Proposed Study.*
3. *Preliminary Analysis or Designs Related to the Research.*
4. *Required Facilities.*
5. *New and Original Contributions to Be Made.*

The student will be expected to independently produce a well-written document, which clearly demonstrates their ability to do research. The preparation of this document shall be conducted over a fixed time period (normally about one month) that will be established by the major professor. The student should also prepare and submit the **request to schedule written or comprehensive examination**. The proposal should be submitted to the student's doctoral committee for evaluation. The student's major professor shall be responsible to distribute the proposal, collect the review results, tabulate the combined score, determine the committee decision, and forward the final result to the Graduate School using **the form** provided by the

Graduate school. *Note that this document is not the same as the thesis proposal required by the Graduate School.*

Oral Component

The oral part of the comprehensive examination shall be given only upon successful completion of the written portion. The student should take the oral portion soon after completing the written exam (within four weeks). The date of the oral examination is requested from the Graduate School on the same **request to schedule written or oral comprehensive examination**. The oral exam shall be approximately two hours in length. The candidate will first be expected to give a brief (20 minutes) presentation of their proposed doctoral research. This will be followed by questions from the examining committee concerning the proposed research and prior course work. The oral examination committee shall be constructed following the requirements outlined in **section 8.43.3** in the *Graduate Manual*.

Dissertation Research Requirements

A dissertation is required for all Ph.D. candidates. A minimum of 18 credit hours under MCE/ISE 699 are accepted for the dissertation research program. However, additional credits appropriate to any remaining uncompleted research may also be taken. The number of credit hours given each semester is variable and is to be determined in consultation with the major professor.

Dissertation and Oral Defense

A written dissertation document is normally submitted around the beginning of a student's final semester. For requirements and instructions regarding **the specific format and expectations for written dissertations**, please consult **sections 11.12-11.16** in the *Graduate Manual*. The oral defense of one's dissertation is a two-hour examination before the dissertation defense committee (composed of the doctoral committee and two additional members appointed by the Dean of the Graduate School). It needs to be scheduled using the **request to schedule the oral defense form**. Consult **section 7.58.1** in the *Graduate Manual* for more information. If the corrections to the dissertation are required they need to be certified using **this form**.

Nomination to Graduate

During the final semester, the major professor must prepare and submit a **nomination to graduate form** for a Ph.D. student to graduate that semester.

DIRECT DOCTORAL DEGREES IN MECHANICAL, INDUSTRIAL AND SYSTEMS ENGINEERING

Requirements for Students without M.S. Degree

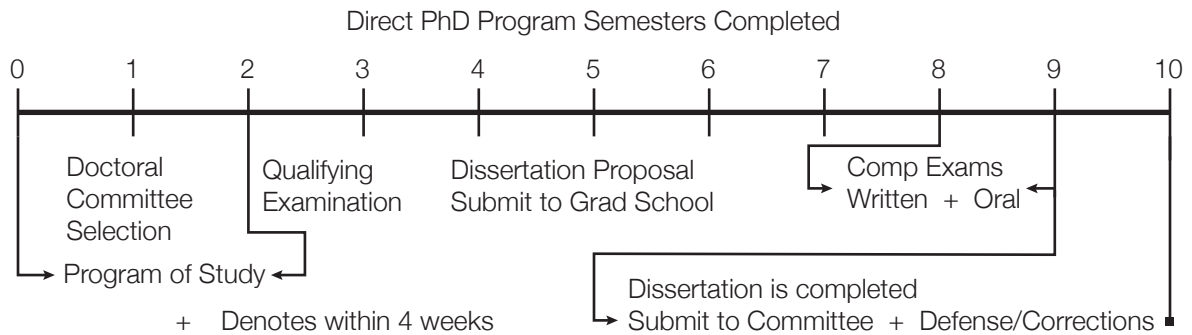


Figure 6: Requirements Timeline for the Direct PhD Degree

Timeline

It usually takes 5 years to complete a Ph.D. degree for students without an M.S. degree. However, Graduate School allows up to 7 years, not including Leaves of Absence approved by the Graduate School, to complete your Ph.D. degree. You are also required to maintain continuous registration until you receive your degree.

Eligibility

Students with exceptional records holding only a bachelor's degree can apply for a direct doctoral program. Superior Masters candidates can also apply for the direct Ph.D., and for such students, approval into the program will automatically include successful completion of the doctoral candidacy review (as outlined previously). The requirements for this program are essentially the same as for a regular Ph.D., except that the master's thesis is waived, and a qualifying examination is required.

Course Work Requirements

For a doctoral degree, a minimum of 72 credits are required (which includes a required 45-48 credits of course work). Nine of these course work credits may be at the 400 level. The remaining 24-27 credits would then be taken as a doctoral dissertation under MCE/ISE 699. Students will be required to satisfy the master's core requirements of their respective tracks (as listed previously).

Doctoral Committee Selection

A doctoral committee must be established for each Ph.D. candidate. This committee must consist of at least three faculty members (including the major professor), one member of which must be from another department. This committee should be selected after the first semester of full-time course work (or after 6-9 credits of part-time study), and will supervise the candidate's entire program of study. [Establishment of doctoral committee form](#) needs to be filed with the Dean of the Graduate School.

Qualifying Examination

Students in the direct doctoral program are required to take a qualifying examination, which will assess the student's ability to perform at the doctoral level, during their first two academic semesters. The qualifying examination is usually administered right after the completion of the first academic semester. It is the responsibility of the Graduate Program Director to consult with either a departmental committee or the major professor in order to determine the type (written, oral, or both), prepare, and administer the examination(s). In general, written examinations shall be a minimum of four hours long, and oral examinations shall be a minimum of two hours long. Consult [section 7.55](#) of the *Graduate Manual* for more details. Results of the exam are reported using [this form](#).

Program of Study

A doctoral [program of study form](#), signed by the student, major professor, and the Graduate Program Director or department chair, should be completed (electronic form is preferred) and submitted to the Dean of the Graduate School by all students after completing one semester of full-time study (or 6-9 credits of part-time study). It is ideal to complete one's doctoral program of study as soon as possible, and no later than the end of the second semester.

Dissertation Proposal

A [dissertation proposal](#), which is required for all doctoral students, must serve to concisely and clearly describe a problem that will be investigated through research, as well as how this research will be performed and reported. The proposal should be submitted before any substantial research has been completed, and at least one semester before the semester in which the dissertation is submitted (usually during the first or second semester in which students register for research credits). The proposal should be approved by the major professor and the doctoral committee before submittal to the graduate school using the [dissertation proposal approval form](#). For details concerning format requirements for the proposal, please consult [section 7.56](#) in the *Graduate School Manual online*.

Comprehensive Examination

All Ph.D. candidates must take and pass a comprehensive examination that is normally administered after the student's dissertation proposal has been approved (typically during the final semester of course work or during the semester following). The examination will consist of the following two components:

Written Component

The written portion of the comprehensive exam will be a detailed research proposal that will outline the student's anticipated dissertation work. The document will also address future work and will contain the following sections:

1. *Comprehensive Literature Review of the Research Area.*
2. *Formulation of the Proposed Study.*
3. *Preliminary Analysis or Designs Related to the Research.*
4. *Required Facilities.*

5. *New and Original Contributions to Be Made.*

The student will be expected to independently produce a well-written document, which clearly demonstrates their ability to do research. The preparation of this document shall be conducted over a fixed time period (normally about one month) that will be established by the major professor. The student should also prepare and submit the **request to schedule the written or comprehensive examination**. The proposal should be submitted to the student's doctoral committee for evaluation. The student's major professor shall be responsible to distribute the proposal, collect the review results, tabulate the combined score, determine the committee decision, and forward the final result to the Graduate School using **this form**. *Note that this document is not the same as the thesis proposal required by the Graduate School.*

Oral Component

The oral part of the comprehensive examination shall be given only upon successful completion of the written portion. The student should take the oral portion soon after completing the written exam (within four weeks). The date of the oral examination is requested from the Graduate School on the same **request to schedule the written or oral comprehensive examination**. The oral exam shall be approximately two hours in length. The candidate will first be expected to give a brief (20 minutes) presentation of their proposed doctoral research. This will be followed by questions from the examining committee concerning the proposed research and prior course work. The oral examination committee shall be constructed following the requirements outlined in **section 8.43.3** in the *Graduate Manual*.

Dissertation Research Requirements

A dissertation is required for all Ph.D. candidates. A minimum of 18 credit hours under MCE/ISE 699 are accepted for the dissertation research program. However, additional credits appropriate to any remaining uncompleted research may also be taken. The number of credit hours given each semester is variable and is to be determined in consultation with the major professor.

Dissertation and Oral Defense

A written dissertation document is normally submitted around the beginning of a student's final semester. For requirements and instructions regarding **the specific format and expectations for written dissertations**, please consult **sections 11.12-11.16** in the *Graduate Manual*. The oral defense of one's dissertation is a two-hour examination before the dissertation defense committee (composed of the doctoral committee and two additional members appointed by the Dean of the Graduate School). It needs to be scheduled using the **request to schedule the oral defense form**. Consult **section 7.58.1** in the *Graduate Manual* for more information. If the corrections to the dissertation are required they need to be certified using **this form**.

Nomination to Graduate

During the final semester, the major professor must prepare and submit a **nomination to graduate form** for a Ph.D. student to graduate that semester.

GENERAL INFORMATION

Course Taken as an Undergraduate for Graduate Credit

Some undergraduate students would have taken graduate-level courses that were not used for their undergraduate degree requirements. For example, five-year combined BS/MS degree students are officially admitted to the graduate program after they complete all the requirements for their BS degree, but are required to take several graduate level courses in their senior year.

Five-year combined BS/MS degree students during their exit interview (degree audit) with the Associate Dean for Student Affairs of the College of Engineering (U.G. Dean) need to make sure that the courses taken as undergraduates for the graduate credit are not listed on their undergraduate degree.

Courses taken as an undergraduate that were not used towards the undergrad degree and are intended to be used towards a graduate degree later will need a letter from the U.G. Dean stating that these credits were not used towards the undergraduate degree. The procedure for this is as follows:

- 1) The major advisor needs to make an official request to the U.G. Dean on letterhead that briefly explains the request; indicating the specific courses taken and asking that it be verified that these courses were not used for BS degree credit. This signed memo can be scanned and e-mailed to the U.G. Dean.
- 2) The U.G. Dean will then view your undergraduate records to see if these courses were used to satisfy BS degree requirements
- 3) An official memo from the U.G. Dean then gets sent to the Graduate School.

Special Notes on 5-Year BS/MS Program

All students accepted into 5-year BS/MS program are eligible only for MS thesis option. They will be matriculated into the graduate program the summer following their senior year capstone design project, and need to start working on their MS thesis that summer under the supervision of their faculty advisor. These students should expect to personally finance their MS studies unless prior TA/RA arraignments are in place.

It is advisable to find the faculty advisor as soon as possible (ideally during the graduate program application process in their junior year) to arrange for a thesis research topic and to develop the corresponding program of study. The faculty advisors should also write a recommendation/support letter for the student graduate application stating that they will supervise their MS thesis.

The available topics for thesis research will be published yearly on the department's website to help the prospective student select their advisor (for details refer to the "Finding an Advisor" section). It is not advisable to start the first summer as graduate students without faculty advisor and thesis research topic.

Graduate Seminar Requirements for Mechanical Engineering

All full-time M.S. and Ph.D. mechanical engineering students are required to register for and are expected to attend the Graduate Seminar sequence MCE 501 (Fall term) and MCE 502 (Spring term) during each semester of residency. These courses will have a number of leading experts discussing relevant topics of interest to graduate students and faculty in mechanical, industrial and systems engineering. Speakers will come from the industry, from other universities, and from our own campus. Graduate students may also be asked to present their work. They will provide a significant opportunity for exposure and for broadening the students' educational experiences and background. Attendance requirements for graduate students will be set each semester by the faculty member coordinating the seminar program.

Thesis and Dissertation Defense

Candidates working on a thesis/dissertation must defend their research in an open forum before their examining committees and any other interested faculty or students. Candidates will be expected to give a brief oral presentation of approximately 25 minutes in length. This presentation should be done according to accepted professional standards, normally using PowerPoint (or equivalent) to illustrate the major results of the work. After the presentation, the candidate will be expected to independently answer questions on topics related to the research. All defenses should be publicly announced to the department and university approximately one week before the scheduled defense date. Information for the announcement should be given to the department secretary and be posted on a department bulletin board. **Approval to hold a thesis or dissertation defense** must be secured from the Graduate School well in advance of the desired defense date (see the *Graduate School Manual* for further details).

Continuous Registration Requirements

All matriculated full-time and part-time graduate students must maintain continuous registration. A *Leave of Absence* form should be filed with the Graduate School for each semester that no course work is taken. Students who have completed all required course work and thesis research should register for *continuous registration* (CRG 999), for which no grade or credit is given. Please refer to the *Graduate School Manual* for more information on this topic.

Finding an Advisor

Although the *Graduate Studies Director* will act as a temporary advisor, all graduate students should find a permanent advisor as soon as possible. Many full-time students who are on assistantship support will be assigned an advisor upon admission. Other students will be expected to pursue and choose their own advisor. Students in the latter group should first contact (by email or telephone) department faculty in their area of interest. It is suggested that you introduce yourself, explain the purpose of the contact, and set up a personal meeting with the faculty member. At the meeting, you should discuss your interests and background and discuss those of the faculty member. After completing such discussions, pursue the particular individual that seems best for your program objectives. Both

you and the faculty member have to agree to finalize the selection. If you have difficulties with this process, contact the Graduate Studies Director for aid.

Graduate Student Offices, Mailboxes, and Keys

All full-time graduate students will be given office space and a mailbox within the department. Priority for offices will be given to students in assistantship and instructorship positions. Department keys for the mail room and offices are issued by the department secretary. All students who are completing their graduate studies must return all keys back to the department. Failure to return keys or other department materials may result in a delay of your degree.

Forms that must be submitted to the Graduate School

The following list names the major items that must be approved and on file at the Graduate School. The forms for each of these and many other related items may be obtained from the Graduate School's website at <https://web.uri.edu/graduate-school/forms/>.

Doctoral Forms

Certification that Mandatory Corrections were Made to a Defended Dissertation

Commencement Questionnaire

Dissertation Format Guidelines

Dissertation Proposal Approval Form

Doctoral Proposal: see Brochure on this Page

Establishment of a Doctoral Committee

Nomination for Graduation – PhD

Program of Study – PhD

Request to Schedule an Oral Defense of a Doctoral Dissertation

Request to Schedule the Written and Oral Doctoral Comprehensive Examination

Results of a Qualifying Examination

Results of Written Doctoral Comprehensive Examination

Masters Forms

Results of Oral Masters Examination

Results of Written Masters Examination

Certification that Mandatory Corrections were Made to a Successfully Defended Thesis

Establishment of a Masters Committee

Nomination for Graduation – Masters Degree

Program of Study Masters Thesis

Request to Schedule an Oral Defense of a Masters Thesis

Thesis Format Guidelines

Thesis Proposal Approval Form

Nomination for Graduation – Non-Thesis

Program of Study – Non-Thesis

