UNIVERSITY of VIRGINIA

SCHOOL of ENGINEERING & APPLIED SCIENCE

Department of Systems and Information Engineering

GRADUATE STUDENT HANDBOOK
2025 – 2026

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CONTENTS

Acronyms used in this handbook

Accelerated Master's Program (AMP)
Applied Math (APMA)
Bachelor of Science (B.S.)
Doctor of Philosophy (Ph.D.)
Graduate Research Assistantship (GRA)
Graduate Teaching Assistantship (GTA)
Master of Engineering (M.E.)
Master of Science (M.S.)
Satisfactory/Unsatisfactory (S/U)
School of Engineering and Applied Science (SEAS)
Student Information System (SIS)
Systems and Information Engineering (SIE)
Systems Engineering (SE)
University of Virginia (UVA)
Virginia Engineering Online (VEO)

1. INTRODUCTION

1.1. Department of Systems and Information Engineering

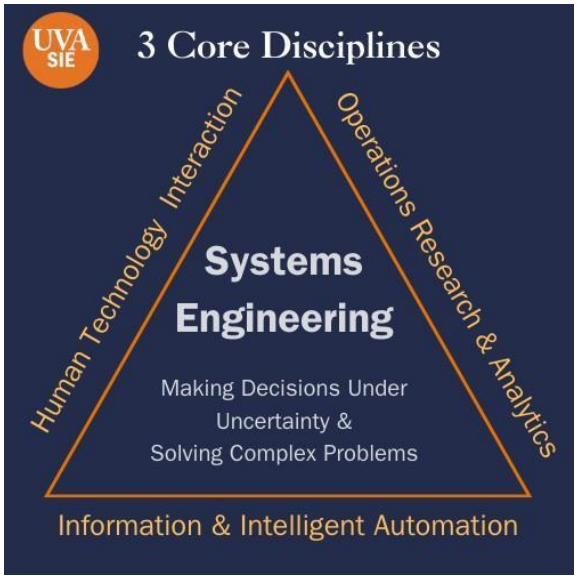
The Engineering School's Department of Systems and Information Engineering (SIE) at the University of Virginia (UVA) was founded in 1976.

SIE is now home to more than 30 full-time and joint-appointed faculty members with active teaching and research programs. We offer an accredited undergraduate degree: the Bachelor of Science (B.S.) in Systems Engineering (SE). We also offer two master's degrees: the Master of Science (M.S.; with thesis) and Master of Engineering (M.E.; non-thesis). Finally, we also offer the Doctor of Philosophy (Ph.D.) degree in Systems Engineering.

SIE graduate students play a critical role in our department's research, teaching and service mission, partnering with faculty and staff to deliver excellence in education and discovery. We believe that a better future is possible for all by training the leaders of tomorrow in a collaborative academic environment that encourages excellence in the classroom and laboratory.

1.2. Vision Statement

Systems engineering is the scientific discipline focused on designing, analyzing, and improving complex human/technology/software systems that range from delivering information to multi-person sociotechnical systems to positively impact human well-being and society at large. We adopt systems thinking to make sense of the complexity of the world to tackle societal challenges.



Specifically, the Systems and Information Engineering Department here at the University of Virginia aims to advance the methods, frameworks, science, and/or technology in three domains:

1. **Human Technology Interaction** - this involves the application of scientific principles, methods, and data drawn from a variety of disciplines to the design and development of engineering systems to facilitate the interaction between humans (users) and technology.
2. **Information and Intelligent Automation** - this focuses on smart, intelligent, and automated technology and method development that explores innovative ways these intelligent systems can improve society.
3. **Operations Research and Analytics** - this focuses on the development and application of analytical methods to improve decision-making by employing techniques such as modeling, statistics, and optimization to arrive at optimal or near-optimal solutions to decision-making problems.

1.3. Diversity and Community

SIE is committed to sustaining a vibrant and inclusive environment that fully reflects the core Engineering School's value of diversity, which is defined as "excellence expressing itself through the intersection of every individual's perspective and lived experiences." Faculty, staff, and students will strive for excellence in all we do, treat everyone with respect, and show gratitude and provide outstanding stewardship for the resources that support our mission, which come from tuition, the commonwealth, research sponsors, and our friends and alumni.

2. MASTER OF ENGINEERING PROGRAM

Any student enrolled in the Master of Engineering (M.E.) program prior to the fall 2019 semester has the option of adhering to either (a) the curriculum presented below or (b) the curriculum that was effective when the student first enrolled in the M.E. program.

2.1. Overview

The M.E. is a coursework-based graduate professional degree for those wishing to pursue careers in industry, consulting, or government. Our program is designed to provide a blend of fundamental knowledge and professional skills needed by practicing engineers.

It is an intensive, non-thesis program that may be completed on-Grounds as a full-time student; in our weekend Accelerated Master's Program (AMP); online as a student in the Virginia Engineering Online (VEO) program; or in a hybrid combination of VEO and time on-Grounds.

The M.E. degree in SE program is built of two components:

- ***Core courses***, supplying the fundamentals of systems engineering.
- ***Elective courses***, focusing on techniques of analysis and application of fundamentals to a problem area.

2.2. Admissions Criteria and Scholarships

The deadlines for M.E. on-Grounds and VEO applications for U.S. citizens and permanent residents are August 1st for the fall semester and January 6th for spring semester. The deadlines for M.E. on-Grounds and VEO applications for non-U.S. citizens are April 1st for fall semester and September 30th for spring semester. The deadline for the Accelerated Master's Program (AMP) M.E. for Summer 2025 is May 16th. We seek motivated students from diverse backgrounds who are eager to partner with us in education and discovery. Information about academic eligibility can be found on the UVA Graduate School of Engineering's webpage All applications are submitted online. The application fee for UVA Engineering graduate programs is $85; however, we are thrilled to share that a fee waiver for the $85 application fee will be automatically applied to your application if you are applying for 2025 admission.

Through the generosity of our friends and alumni, our department is pleased to award scholarships to select exceptionally qualified M.E. candidates. Recipients receive $5,000 per academic year. All candidates are evaluated by the graduate program directors on academic performance, and at their discretion, the recipients are selected. The selected recipients are notified with a letter from the department.

Accepted M.E. students in the on-Grounds program are also eligible to serve as graders for SIE undergraduate and graduate courses. Students interested in serving as a grader should contact the SIE Graduate Program Director and M.E. Program Director directly. The hourly rate for M.E. student graders is $21/hour for up to twenty (20) hours per week.

2.3. Engineering School Requirements

Engineering School requirements for M.E. degrees are described on the UVA Graduate School of Engineering's information webpage. This page also addresses admission requirements, rules and regulations financial assistance and outside employment, and other matters. The portion of the Engineering School's website devoted to current graduate students contains many helpful resources including required forms.

Time limit: All requirements for the M.E. degree must be completed within seven years after matriculation to the graduate program.

2.4. Program Requirements: SE M.E. on-Grounds/VEO

A candidate for the M.E. degree must fulfill the general requirements of the Engineering School and complete an approved plan of study consisting of at least thirty (30) credit hours. The plan of study must be prepared under the guidance of the faculty advisor by the end of the first semester of study. It then must be approved by the SIE graduate program directors. The approved plan of study may be revised if necessary but must be submitted for approval.

Coursework

The M.E. in SE requires thirty (30) credits of coursework. The following requirements should be met:

- Three (3) credit hours of SYS 6001 Introduction to Systems Analysis & Design
- Six (6) credit hours of Foundation Courses: two (2) courses selected from SYS 6003 Optimization Models and Methods I, SYS 6005 Stochastic Modeling I, SYS 6007 Human Factors I, and SYS 6021 Statistical Modeling I.
- At least twenty-one (21) credit hours of elective courses distributed thusly:
    - At least twelve (12) credit hours of graduate-level systems engineering courses at the 5000, 6000, or 7000 level. (These credit hours cannot be earned through SYS 6993 and SYS 7993 Independent Study; SYS 6995 and SYS 8995 Supervised Project Research; SYS 8997 and SYS 9997 Graduate Teaching Instruction; SYS 8999 Thesis; and SYS 9999 Dissertation.)
    - No more than three (3) credit hours of SYS 6993 or SYS 7993 Independent Study.
    - No more than three (3) credit hours of SYS 6995 or SYS 8995 Supervised Project Research.

Table 2-1 shows a plan of study for completing an M.E. degree in two (2) semesters.

Course Number		**Credits**
Fall Semester		
SYS 6001	Introduction to Systems Analysis & Design	3
SYS 6003/05/07/21	Optimization Models and Methods I/Stochastic Modeling I/Human Factors I/Statistical Modeling I.	3
SYS	Stochastic Modeling I/ Optimization Models and Methods I/Human	3

6005/03/07/21	Factors I/Statistical Modeling I.	
SYS XXXX	Elective	3
YYY XXXX	Elective	3
	SUBTOTAL	15
Spring Semester		
SYS XXXX	Elective	3
SYS XXXX	Elective	3
SYS XXXX	Elective	3
YYY XXX2	Elective	3
YYY XXX3	Elective	3
	SUBTOTAL	15

Table 2-1: A sample plan of study for the M.E. program:

Special Circumstances

Prerequisites: The student who does not have the prerequisites (e.g., calculus, linear algebra, probability and statistics, computer programming) should take articulation courses. The SE M.E. program advisor will work with the student to identify the required articulation courses. These courses cannot be used to satisfy the degree requirements.

Equivalent Courses: The student who, prior to enrolling in the SE M.E. program, has already taken a course equivalent to a core course may petition the M.E. program advisor for the substitution of the core course by an elective course.

2.5. Program Requirements: Accelerated Master's Program

The Accelerated Master's Program (AMP) in SE is a one-year program held in Northern Virginia designed to enable working professionals to become systems thinkers and problem solvers through a unique blend of formal education integrated with personal work experience. AMP students attain a solid foundation in systems methodology and apply proven analytical tools and new technologies to "messy" problems in the face of uncertainty, risk, and environmental turbulence. Through their coursework and collaboration with classmates from diverse industries, participants find that they look at problems with new eyes and finish the program well-equipped to support effective decision- making involving any large-scale complex system.

Coursework

The Accelerated Master's Program (AMP) in SE is built from three academic components:

- ***Core courses***, supplying the fundamentals of systems engineering.
- ***Program elective courses***, focusing on important analytical techniques and business skills, which complement the skills presented in the core courses.
- ***General elective courses***, utilizes VEO catalog of online electives and enables students to pursue interests beyond core courses and program electives. All general electives are

subject to approval from the AMP Director.

The plan of study must include at least thirty credit hours of graduate-level work and satisfy the following requirements:

Twelve credit hours of core courses: SYS 6001, SYS 6002, SYS 6043, SYS 6045.

- Twelve credit hours of program elective courses consisting of: SYS 6064, SYS 6582, SYS 6021, SYS 6014, SYS 6018.
- Six credit hours of general VEO electives subject to approval by AMP Program Director.

Special Circumstances

Prerequisites: The student who does not have the prerequisites (e.g., two semesters of calculus, one semester of linear algebra and one semester of computer programming) should take articulation courses. The AMP program director will work with the student to identify the required articulation courses. These courses cannot be used to satisfy the degree requirements.

2.6. Transfer Credit

Up to twelve (12) credit hours of graduate courses may be transferred. Only courses with a grade of B or better that have not been applied toward another degree may be transferred. The request for credit transfer must include the following: a completed Request Approval of Transfer Credits form, a description of course content and level, and an official transcript. The documents are uploaded with the form submission. If the student is already admitted into a UVA program, then the request for credit transfer must be pre-approved before the course is taken. All transfer credits are subject to the approval of the student's advisor and the Engineering School dean's office.

VEO students may transfer up to fifteen (15) credits from other schools participating in the VEO program toward their UVA M.E. degree. The other VEO institutions are George Mason University, Old Dominion University, Virginia Commonwealth University and Virginia Polytechnic Institute and State University (Virginia Tech). Students in the on-Grounds M.E. program may register for up to twelve (12) credit hours of courses offered through VEO.

2.7. Advising and Professional Development

Upon admission to the program, the student is assigned to their program's M.E. faculty advisor. The student should meet with the M.E. program advisor to plan their course selection and career objectives before the start of each semester.

Seminars: Students in the on-Grounds program are expected to attend and participate actively in scheduled SIE and UVA seminars.

2.8. Academic Progress

Good academic standing is defined as a minimum cumulative grade point average of 3.0. A cumulative grade point average of less than 3.0 may be considered a sufficient reason for withdrawal of financial assistance or for enforced withdrawal from the graduate program. Graduate students may incur academic probation any fall or spring semester in which they fail to maintain a minimum cumulative grade point average of 3.0. Students on academic probation have one semester to increase their cumulative grade point average to 3.0 or above, or they will be placed on academic suspension. VEO students have two semesters to increase their cumulative grade point average.

Students who do not raise their GPA to 3.0 during their academic probation will incur academic suspension. Academic suspensions may be appealed within 30 days of notification to the UVA Engineering Graduate Studies Committee. Without an approved academic suspension appeal from the UVA Engineering Graduate Studies Committee, students are permanently academically suspended from the School of Engineering and are not eligible for readmission. Approved academic suspension appeals from the UVA Engineering Graduate Studies Committee provide the student a prescribed number of semester(s) of academic probation to increase their cumulative grade point average to 3.0.

2.9. Administrative Forms

It is important that graduate students submit administrative forms related to degree requirements promptly to the SIE Student Services Coordinator. These forms can be found on the Engineering School's webpage for current engineering graduate students.

3. MASTER OF SCIENCE PROGRAM

3.1. Overview

Master of Science (M.S.) is a graduate degree for those who desire not only to acquire fundamental knowledge but also to contribute to the advancement of knowledge through independent, original research. This program provides a springboard for careers as an academician, as a researcher, as a consultant or in management/leadership within a university, institute, industry, or government setting.

The SIE M.S. program includes three (3) components:

- ***Coursework*** to gain fundamental and advanced knowledge.
- ***Research*** conducted in a collaborative environment leading to a thesis and scholarly papers.
- ***Engagement*** in UVA's intellectual life.

3.2. Admissions Criteria

The deadlines for M.S. applications with financial aid requests are January 6th for fall semester and September 30th for spring semester. All SIE faculty are eligible to advise students enrolled in the SE M.S. program. We accept applications from candidates with degrees from all engineering and some affiliated backgrounds. In some cases, candidates who do not have engineering or similar credentials will be offered conditional admission, which will require them to take selected undergraduate coursework in addition to the coursework required for their M.S.

All candidates are evaluated by one (1) or more of the SIE research subgroups. Some students are admitted directly into a specific research group with a specific advisor. Other candidates are admitted into a subgroup and are then connected with an advisor during the first year.

Most accepted M.S. students receive financial aid. Funding offers take the form of graduate research assistantships (GRAs), graduate teaching assistantships (GTAs) and/or various fellowships. The department's default stipend for master's students is $27,037.50 per year. Funded offers also include tuition and health insurance. Some M.S. students are funded by third-party entities (e.g., their employer or government or military agencies), and a small number of students are self- funded.

3.3. Engineering School Requirements

Engineering School requirements for M.S. degrees are described on the UVA Graduate School of Engineering's information webpage. This page also addresses admission requirements, rules and regulations pertaining to financial assistance and outside employment, and other matters. The portion of the Engineering School's website devoted to current graduate students contains many helpful resources, including required forms.

Time limit: All requirements for the M.S. degree must be completed within five years after matriculation to the graduate program.

3.4. Program Requirements

A candidate for the M.S. in SE must fulfill the general requirements of the Engineering School along with the following specific requirements.

Coursework

The M.S. in SE requires thirty (30) credits of coursework and research beyond the B.S. program. The following requirements should be met:

- Three (3) credit hours of SYS 6001 Introduction to Systems Analysis & Design
- Six (6) credit hours of ***Foundation Courses***: two (2) courses selected from SYS 6003 Optimization Models and Methods I, SYS 6005 Stochastic Modeling I, SYS 6007 Human Factors I, and SYS 6021 Statistical Modeling I.
- Fifteen (15) credit hours of graded, graduate-level elective courses distributed thusly:
    - At least three (3) credit hours of systems engineering courses at the 6000 or 7000 level. (These credit hours cannot be earned through SYS 6993 and SYS 7993 Independent Study; SYS 6995 and SYS 8995 Supervised Project Research; SYS 8997 and SYS 9997 Graduate Teaching Instruction; SYS 8999 Thesis; and SYS 9999 Dissertation.)
    - No more than three (3) credit hours of SYS 6993 or SYS 7993 Independent Study.
    - No more than three (3) credit hours of SYS 6995 or SYS 8995 Supervised Project.
- Two (2) semesters of SYS 7096 Systems Engineering Colloquium (required) in the first academic year (1 zero-credit hour per semester).
- At least six (6) credit hours of SYS 8999 Thesis (of which six count toward the thirty-credit requirement).

Special Circumstances

Prerequisites: The student who does not have the prerequisites (i.e., calculus, linear algebra, probability and statistics, computer programming) should take articulation courses. These courses cannot be used to satisfy the degree requirements.

Equivalent Courses: The student who, prior to enrolling in our graduate program, has already taken a course equivalent to a core course may petition the graduate programs director for the substitution of the core course by an elective course.

Transfer Credit: Up to six credit hours of graduate courses may be transferred. Only courses with a grade of B or better that have not been applied toward another degree may be transferred. The request for credit transfer must include the following: a completed Request Approval of Transfer Credits form, a description of course content and level, and an official transcript. The documents are uploaded with the form submission. If the student is already admitted into a UVA program, then the request for credit transfer must be pre-approved before the course is taken.

Scholarship

A student must be the author or coauthor of at least one (1) technical manuscript under review or accepted into a conference or journal before scheduling their final thesis defense.

Thesis and Committee

M.S. students will work with their advisor to identify a suitable master's research topic. Up to six (6) of the thirty credits toward the M.S. will typically comprise thesis research via the SYS 8999 Thesis listing. The M.S. candidates and their advisor will also select an M.S. thesis committee comprising at least three (3) UVA faculty members. One (1) of these three (3) members may be from outside SIE. At least two (2) of the three (3) members must be faculty members with non-zero percentage appointments in SIE. The thesis committee must review and approve the student's academic requirements report, written thesis, and oral thesis defense. M.S. students should check the accuracy and completeness of their academic requirement report in the Student Information System (SIS) frequently, at least at the start and end of each semester and in consultation with their faculty advisor. The Appointment of Final Examination Committee form to appoint the M.S. thesis committee must be submitted at least fourteen (14) days before the proposed final defense date to the SIE Student Services Coordinator, as they will obtain graduate program director approval and submit the request form to the graduate office. Degree candidates must apply for graduation in SIS at the beginning of the semester in which they're expected to graduate.

It is the candidate's responsibility to email the SIE Student Services Coordinator their announcement information which consists of the committee members list with the chair and advisor identified, the meeting date, time, and location information, and the thesis defense title and abstract at least two (2) weeks before the final defense. The SIE Student Services Coordinator will provide the student with the information regarding the final defense forms, ideally the day before so the forms can be initiated and sent to the chair before the final defense starts. The chair completes the forms based on committee feedback and assessment. In addition, after successful completion of their final defense, the candidate must submit the dissertation via Libra (see Graduation Procedure).

Seminar Series

SIE is committed to providing members of our community with the opportunity to learn from a wide range of scholars and practicing engineers through seminars. These seminars are organized as (a) our weekly Graduate Colloquium and (b) Distinguished Speakers invited by our faculty. As an essential component of graduate education, M.S. students should register for at least two semesters (preferably in their first year) of SYS 7096 Systems Engineering Colloquium with zero credit hours. Students are expected to attend and participate actively in scheduled SIE and UVA seminars and student thesis/dissertation defenses. Unless there are extenuating circumstances, it is expected that seminars and defenses are held in person at the university.

Training and Engagement

M.S. students are expected to be good citizens of the department by engaging in required training

activities and participating in departmental activities (e.g., symposiums, workshops, social events).

3.5. Academic Progress

Good academic standing is defined as a minimum cumulative grade point average of 3.0 and Satisfactory grade(s) in research and in teaching, when applicable. Unsatisfactory work during any semester or a cumulative grade point average of less than 3.0 may be considered a sufficient reason for withdrawal of financial assistance or for enforced withdrawal from the graduate program. Non-degree and visiting graduate students are also expected to maintain a minimum cumulative grade point average of 3.0 to remain in good academic standing.

Graduate students may incur academic probation any fall or spring semester in which they fail to maintain a minimum cumulative grade point average of 3.0. Students on academic probation have one (1) semester to increase their cumulative grade point average to 3.0 or above, or they will be placed on academic suspension.

Students who do not raise their GPA to 3.0 during their academic probation will incur academic suspension. Academic suspensions may be appealed within thirty (30) days of notification to the UVA Engineering Graduate Studies Committee. Without an approved academic suspension appeal from the UVA Engineering Graduate Studies Committee, students are permanently academically suspended from the School of Engineering and are not eligible for readmission. Approved academic suspension appeals from the UVA Engineering Graduate Studies Committee provide the student a prescribed number of semester(s) of academic probation to increase their cumulative grade point average to 3.0.

3.6. Administrative Forms

It is important that graduate students submit administrative forms related to degree requirements promptly to the SIE Student Services Coordinator. These forms can be found on the Engineering School's webpage for current engineering graduate students.

4. DOCTOR OF PHILOSOPHY PROGRAM

4.1. Overview

The Doctor of Philosophy (Ph.D.) is an advanced graduate degree for students wishing to contribute to knowledge creation through independent, original, cutting-edge research. The Ph.D. degree provides a springboard for careers as an academician, as a researcher, as a consultant or in management/leadership within a university, institute, industry, or government setting.

The SIE Ph.D. program includes three (3) components:

- ***Coursework and Teaching*** to gain fundamental and advanced knowledge, as both student and graduate teaching assistant (GTA).
- ***Research*** conducted in a collaborative environment leading to a doctoral dissertation and scholarly papers.
- ***Engagement*** in UVA's intellectual life.

4.2. Admissions Criteria

The deadlines for Ph.D. applications with financial aid requests are January 6th for fall semester and September 30th for spring semester. All SIE faculty are eligible to advise students enrolled in the SE Ph.D. program. We accept applications from candidates with degrees from all engineering and some affiliated backgrounds. In some cases, candidates who do not have engineering or similar credentials will be offered conditional admission, which will require them to take selected undergraduate coursework in addition to the coursework required for their Ph.D.

All candidates are evaluated by one (1) or more of the SIE research subgroups. Some students are admitted directly into a specific research group with a specific advisor. Other candidates are admitted into a subgroup and are then connected with an advisor during the first year.

Most accepted Ph.D. students receive financial aid. Funding offers take the form of GRAs, GTAs and/or various fellowships. SIE is committed to acquiring the resources to fund Ph.D. students for five years, contingent upon satisfactory progress toward the degree. The department's default stipend for Ph.D. students is $36,050 per year.

Funded offers also include tuition and health insurance. Some Ph.D. students are funded by third-party entities (e.g., their employer or government or military agencies), and a small number of students are self-funded.

4.3. Engineering School Requirements

Engineering School requirements for the Ph.D. degree are described on the UVA Graduate School of Engineering's information webpage. The page also addresses admission requirements, rules and regulations pertaining to financial assistance and outside employment, and other matters. The portion of the Engineering School's website devoted to current graduate students contains many helpful resources, including required forms.

Time limit: All requirements for the Ph.D. degree must be completed within seven years after matriculation to the program. Program Requirements and Milestones

SIE has three (3) general classes of Ph.D. requirements: coursework, professional development, and academic engagement. These are described below.

Coursework

The Ph.D. in SE involves relevant coursework to help students access foundational knowledge in their discipline while striking a balance between depth and breadth. It requires at least seventy-two (72) credit hours of graduate-level work, of which twenty-four (24) credits must be graded coursework beyond the B.S. degree. Students that enter the Ph.D. program with a STEM master's degree must take at least six (6) credits of graded graduate-level course work in the department. If students earned an M.E. or M.S. degree in SE at UVA, they are not required to take additional courses.

Program Requirements:

- Two (2) semesters of SYS 7096 Systems Engineering Colloquium (required) in the first academic year (1 zero-credit hour per semester).
- Three (3) credit hours of SYS 6001 Introduction to Systems Analysis & Design
- Six (6) credit hours of ***Foundation Courses***: two (2) courses selected from SYS 6003 Optimization Models and Methods I, SYS 6005 Stochastic Modeling I, SYS 6007 Human Factors I, and SYS 6021 Statistical Modeling I.
- Fifteen (15) credit hours of graded, graduate-level SYS or other graduate courses relevant to the student's field of study (graduate-level 6000 and above).
- At least thirty-three (33) credit hours of SYS 9999 Dissertation research. The research is performed under the direction of the faculty advisor and the advisory committee and is documented in a written dissertation.
- Fifteen (15) credit hours of electives distributed thusly:
    - Additional credit hours of SYS 9999 Dissertation.
    - Additional graded, graduate-level courses relevant to the student's field of study.
    - No more than three (3) credit hours of SYS 6993 or SYS 7993 Independent Study.
    - No more than three (3) credit hours at the 5000-level from the School of Engineering and Applied Science.

Special Circumstances

Prerequisites: A student who does not have the prerequisites (i.e., calculus, linear algebra, probability and statistics, computer programming) should take articulation courses. These courses cannot be used to satisfy the degree requirements.

Transfer Credit: Ph.D. students who have earned a master's degree in a STEM field will receive an automatic bulk transfer of twenty-four (24) graduate course credits toward SEAS's total graded coursework credit requirement.

- Ph.D. students who have earned a master's degree in a non-STEM field will receive an automatic bulk transfer of twelve (12) graduate course credits toward SEAS's total graded coursework credit requirement. Students who receive a bulk transfer of credit may not transfer any additional credits toward the Ph.D. degree.
- At least six (6) additional credits of graded, graduate-level SYS coursework must be taken at UVA (i.e., they cannot be transferred). A minimum grade of "B" is required.
- Ph.D. students entering without a Master's degree that have previously taken graduate level courses may transfer a maximum of six graduate course credits into their program of study.
- Only courses with a grade of B or better that have not been applied toward another degree may be transferred. The request for credit transfer must include the following: a completed Request Approval of Transfer Credits form, a description of course content and level, and an official transcript. The documents are uploaded with the form submission. If the student is already admitted into a UVA program, then the request for credit transfer must be pre-approved before the course is taken.
- Whether any individual transfer course counts toward our Ph.D. degree ***Foundations Courses*** is determined by the Graduate Program Director. If a student has already taken a course equivalent to a Foundations Course, they may petition the graduate program director for credit. Students that received automatic bulk transfer credits that are applied towards SEAS's credit requirements must complete the SE Coursework Petition Form receive credit towards their degree program requirements. Other transfer coursework taken in another STEM program will count towards elective credits.

Students are encouraged to take additional courses beyond those required for graduation, and work with their Ph.D. advisor and committee in selecting coursework.

Please refer to the UVA Graduate Record for more information:
https://records.ureg.virginia.edu/content.php?catoid=68&navoid=6125#transfer-credit.

Professional Development and Academic Engagement

The following professional training requirements help students prepare for the full spectrum of career choices:

Graduate Teaching Assistantship (GTAs): Students typically serve as a GTA over the course of their MS or PhD. GTAs will enroll for three (3) credits (Satisfactory/Unsatisfactory, or S/U, basis) of SYS 6097 or SYS 9997 Graduate Teaching Instruction in a section corresponding to their supervising instructor. Receipt of one (1) or more U grades for graduate instruction may endanger a student's eligibility to serve as a GTA in future semesters. Information about the Engineering School's language-skills requirements for international students serving as GTAs can be found on the Center for American English Language & Culture's Assessment's website.

Graduate Research Assistantship (GRA): Students will serve as a GRA as a component of their Ph.D. GRAs will enroll for three (3) to twelve (12) credits (Satisfactory/Unsatisfactory, or S/U, basis) of SYS 9999 Dissertation in a section corresponding to their faculty advisor. GRAs conduct academically significant research related to their academic program and their development as future researchers, with a minimum of supervision, under the guidance of a faculty member.

Receipt of one (1) or more U grades for graduate research may endanger a student's eligibility to receive graduate funding in future semesters.

Research Dissemination: Students will disseminate their research via journal and conference papers. Before scheduling the final defense, students must have at least one (1) first- authored paper with their research advisor published or accepted by a journal or peer-reviewed conference paper approved by their advisory committee. To aid in supporting student travel to conferences, all SIE Ph.D. students can apply to receive a travel grant if their research advisor or fellowship is unable to fund their travel, conference registration, and lodging. See the Doctoral Student Travel Grant section below for more information.

Seminars and Defenses: SIE is committed to providing members of our community with the opportunity to learn from a wide range of scholars and practicing engineers through seminars. These seminars are organized as (a) our weekly Graduate Colloquium and (b) Distinguished Speakers invited by our faculty on an ad-hoc basis. As an essential component of graduate education, Ph.D. students should register for at least two (2) semesters (preferably in their first year) of SYS 7096 Systems Engineering Colloquium with zero credit hours. Students are expected to attend and participate actively in scheduled SIE and UVA seminars and student thesis/dissertation defenses. Unless there are extenuating circumstances, it is expected that seminars and defenses are held in person at the university.

Academic Engagement: Doctoral students are valued members of SIE's community of scholars. They are expected to be good citizens by engaging in departmental and school- wide events (e.g., milestone defenses, symposiums, workshops, social events).

Doctoral Student Travel Grant

Each SIE Ph.D. student is eligible to apply for a one-time travel grant of up to $1,500 to present their research at a peer-reviewed conference once during their tenure at UVA. To receive a travel grant, the student must be the primary author presenting a peer-reviewed publication. Additionally, their advisor must write a statement that there are no research funds to support travel. The one-time grant can be requested by using the SIE Ph.D. Student Travel Fellowship Request Form. The request should be submitted at least six weeks prior to the conference date.

Milestones

The three (3) main milestones toward completion of an SE Ph.D. are the qualifying exam, the dissertation proposal, and the dissertation defense. Sections 4.3 and 4.4 provide additional information on the goals, format, timing, and administration of these milestones, including policies governing committee composition.

Table 4-2 depicts a typical timeline for completion of the Ph.D. in SIE. This timeline assumes that students enter the Ph.D. after first completing a master's degree. However, SIE also routinely accepts students directly into the Ph.D. program without first requiring them to complete an M.S. For these students, it may be valuable to extend the initial timeline by one year, in which case students can delay the qualifying exam until the end of their second year. The rest of the timeline

then proceeds as shown in Table 4-2.

Engineering School policy allows a leave of absence (an action students can take after the completion of a semester, indicating that the student plans to be away from the university for at least one semester) for parental leave or serious personal or family illness. This requires notification to and approval from the appropriate department or program and the Office of Graduate Programs. When considering these options, students are urged to talk with their advisor, their program's graduate director, and the Engineering School's graduate registrar. These individuals are committed to helping students find and navigate their best possible paths. Students must first obtain the approval of their advisor and the graduate director of the student's program.

Table 4-2: Typical timeline for doctoral students entering with a master's degree. Students entering without an M.S. may need one extra year before taking the qualifying exam. Different research groups offer qualifying exams at different times of year.

Year 1	Establish a working relationship with the faculty advisor(s) Begin coursework Identify a research area and doctoral committee Prepare a plan of study* Pass the qualifying exam (August)
Year 2	Finish coursework Establish research Present and defend dissertation proposal (March–June)
Year 3	Continue research Submit a paper for publication Attend and present at a research conference
Years 4-5 (as needed)	Complete research Publish additional papers or proceedings Defend dissertation

**The plan of study form is for departmental use only. Students should file the form with an SIE Student Services Coordinator and maintain a copy for themselves to access it whenever they convene their committee and/or complete a requirement. Official tracking for SEAS and SIE requirements is done using the student's academic requirements report in SIS.*

Qualifying Exam

The principal objective of the qualifying exam (also referred to as the comprehensive exam and Ph.D. exam) is to assess a student's research aptitude and confirm that they have the skills necessary to make a substantive contribution in their field. The exam also provides an opportunity for students to receive early, individualized feedback on research output that could influence the direction of their dissertation. As such, preparation for and participation in the exam should be viewed as research.

The qualifying exam is not meant to directly assess content from required courses. Thus, students must have already specified the coursework they will take before the exam. Required coursework

varies by concentration, the student's anticipated dissertation topic, and the recommendation of the student's committee.

Students who have already passed their qualifying examinations at a previous institution may petition the Graduate Program Committee for an exemption from the UVA SIE qualifying exam upon presentation of acceptable evidence (typically a letter from the previous department).

To pass the qualifying exam, students may be asked to demonstrate that they can:

a) Understand, interpret, and critically evaluate relevant literature.
b) Analyze data (via experiments, observations, surveys, simulation, etc.) and draw meaningful conclusions.
c) Apply technical/engineering tools, concepts, coursework and/or approaches to gain insight on real-world problems.
d) Effectively communicate results in both oral and written formats.
e) Answer questions and respond to critical feedback when sharing, defending, and revising their ideas.

The examination consists of two (2) parts, written and oral. The following guidelines apply.

Committee Composition

The examining committee will include three (3) to five (5) members. It is highly recommended that at least two (2) of the faculty have expertise in the student's research area. At least three (3) of the members must be faculty members with non-zero percentage appointments in SIE. External (non-SIE) or courtesy faculty may be a part of the committee, but do not count toward this requirement. In most instances, the qualifying committee contains many of the same members as the student's dissertation advisory committee. However, this is not mandatory.

The chair of the qualifying exam committee should have an appointment in SIE and cannot be the student's advisor. The chair will be responsible for collecting and delivering feedback to the student, as explained below.

Committee Creation and Preliminary Scheduling

Students should work with their advisor to identify a qualifying exam committee and schedule their exam to take place no later than the end of their second year in the SIE department.

The student should send a completed Recommendation and Certification of Doctoral Advisory Committee form to the SIE Student Services Coordinator no later than two (2) weeks prior to the date of the written exam component. Students should meet with each of their committee members before beginning their exam preparations so they can discuss how they can best use their time.

Structure and Format of Exam

There are two (2) options for the qualifying exam. Students should work with their advisor to identify the format that best suits their research goals.

Option 1: Targeted Research Questions: In this option, the student's committee will formulate a set of targeted research questions based on a research summary and reading list prepared by the student. The student will then have up to one week to prepare written answers to those questions. This will be followed by an oral exam.

Students will work with their individual examination committees to identify dates for the written and oral components of the exam. They should then work backward from those dates to complete the activities summarized below. Figure 4-3 provides a sample timeline for completing the exam.

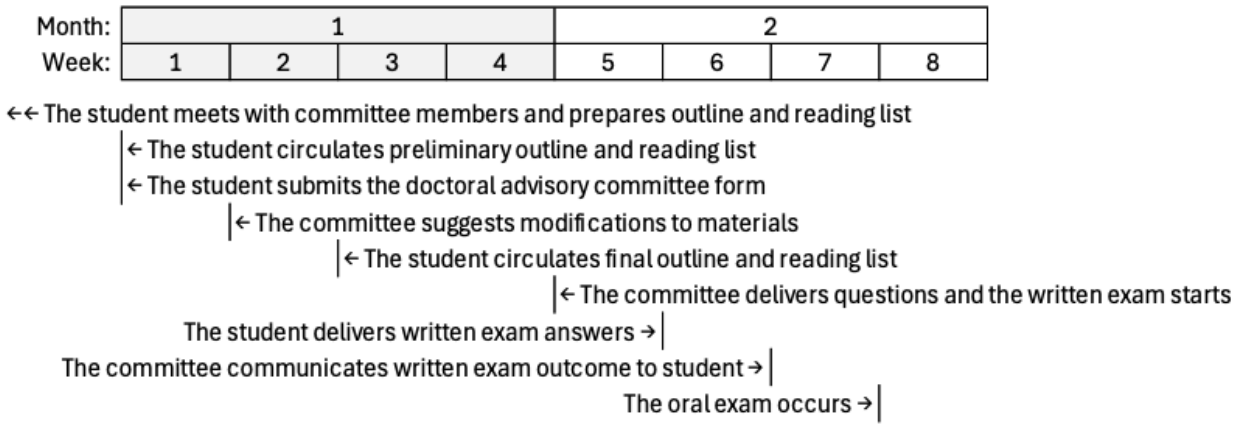
This qualifying exam should proceed as follows:

1. **The student** should prepare a two-page document that outlines their research area and explains how it will advance knowledge in their Ph.D. discipline.
2. **The student** should prepare a preliminary reading list (research papers, book chapters, etc.) organized by topic to be used in their qualifying exam. The student is encouraged to start preparing these materials early and to meet or engage with their committee members to establish a comprehensive reading list.
3. **The student** should circulate these materials to their committee members no later than **one (1) month before** their scheduled written exam start date.
4. **Committee members** will have one (1) week **(three (3) weeks** before the written exam start date**)** to respond to the student with suggested modifications to their proposed reading list.
5. **The student** will then circulate the final reading list to the whole committee no later than **two (2) weeks** before the written exam start date.
6. **Committee members** will then prepare their questions based upon the research overview and finalized reading list. They will forward the questions to the advisor and other committee members before the exam with enough time for everyone to evaluate the exam before it begins. As the person who is most familiar with the student's research area and how the exam could be best used for their benefit, it is highly recommended that **the advisor** coordinate with the committee to create a coherent and targeted set of questions.
7. **The committee chair** will deliver the questions to the student on the scheduled day of the exam.
8. **The student** will work on the exam for up to seven (7) days (unless the committee specifies a different time frame). Responses should be prepared as a single written document that should state each question followed by its response.
9. **The student** will submit their solutions to the examination committee at the end of the exam period.
10. **The committee** will have up to one (1) week to read the student's response and confer. They should ultimately communicate to the chair whether the student has passed or failed the exam and/or whether any additional response is required
11. **The committee chair** will communicate the results of the evaluation to the student. If the student passed the written portion, they should proceed to the oral portion of the exam.
12. Unless otherwise specified by the committee chair, **the student** should schedule the oral

exam for one (1) hour. The exam should be scheduled to occur in less than two (2) weeks of notice to proceed.

13. **The student** should prepare a 30-minute presentation summarizing their answers to the exam questions.
14. The student will present at the oral exam. The remaining exam time will be used for questions from the committee.
15. The committee will collectively determine the examination's outcome: pass, pass with remediation, or fail.
16. The committee will collectively determine the examination's outcome: pass, pass with remediation, or fail.

Figure 4-3: Example Schedule for the targeted research questions qualifying exam option.



Option 2: Individual Research Project: In this option, the student will propose an independent research product. The student then completes this research product and documents it in a form suitable for publication as a peer-reviewed conference paper or journal article. This could be anything that constitutes publishable research in the student's research area. This could include (but is not limited to): an experiment, a simulation study, an analysis on an existing data set, an observation study, a model-based analysis, a novel mathematical proof, or a systematic literature review. The work used for the qualifying exam must exclusively be the student's work (in conference with their advisor and examination committee) and cannot be a previously completed or published effort.

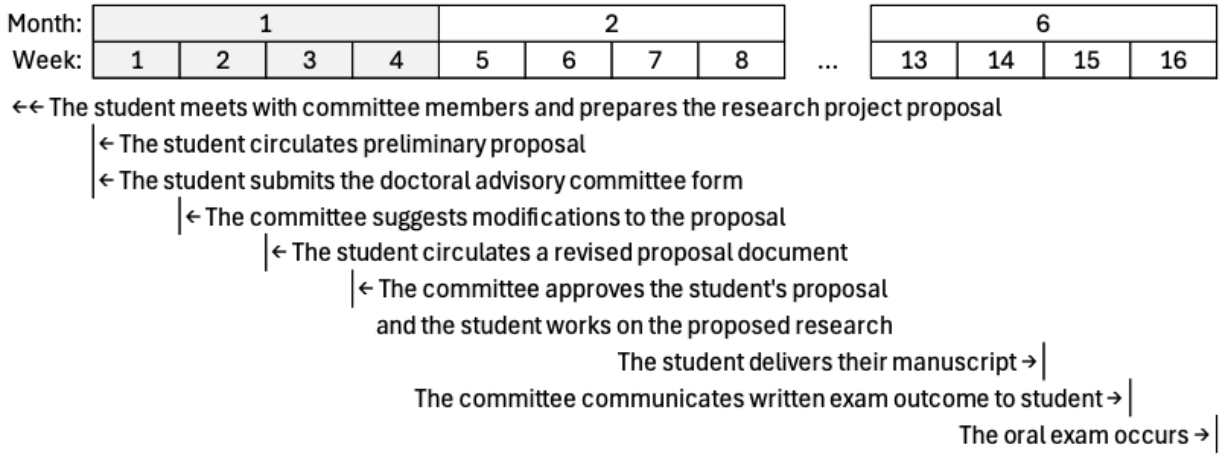
This qualifying exam should proceed as follows (Figure 4-4 provides a sample timeline for completing the exam):

1. **The student** should prepare a proposal document that is three (3) single-spaced pages long (excluding references). Text should be in 10- or 11-point Arial or Times New Roman font. The document should propose the research project the student plans to pursue. There is no set format for this document, but it is recommended to have the following sections:
    - **Background/Problem Statement**: Provide a brief background on the topic area and/or the problem the research is going to solve.
    - **Research Objectives**: The specific research questions that will be answered, hypotheses that will be tested, and/or research objectives.

- **Proposed Methods**: How the student plans to answer the research questions, test the hypotheses, and/or achieve the research objectives.
- **Contributions**: A description of what the project will produce, why it is important, and why the work is novel.
- **Deliverables:** What the student proposes to deliver to the committee at the end of the process. At minimum, this should include a conference paper or journal article manuscript documenting the completed research.
- **Timetable:** A proposed schedule for completing the proposed work. This can be flexible but should be a minimum of 2-months and maximum of 9-months.
- **Bibliography**: References cited in the other sections and papers the student thinks are pertinent to the proposed research.

2. **The student** should circulate a preliminary version of proposal to their committee.
3. **Committee members** will confer and (within one (1) week) communicate any revisions and recommendations (to the proposal or bibliography) to the **committee chair.**
4. **The committee chair** will synthesize committee recommendations and send them to the student.
5. **The student** will revise the proposal and repeat steps 2-4 until the committee is satisfied with the student's proposal.
6. **The student** will complete their research proposal in accordance with the proposed timetable. The student is encouraged to engage with their adviser and the rest of their committee during this process as necessary to keep the research on track and/or respond to unexpected issues that arise.
7. **The student** will submit their solutions to the examination committee at the time prescribed in the timetable.
8. **The committee** will have up to two (2) weeks to read the student's response and confer. They should ultimately communicate to the chair whether the student has passed or failed the written exam and/or whether any additional response is required
9. **The committee chair** will communicate the results of the evaluation to the student. If the student passed the written portion, they should proceed to the oral portion of the exam.
10. Unless otherwise specified by the committee chair, **the student** should schedule the oral for one (1) hour. The exam should be scheduled to occur in less than two (2) weeks of notice to proceed.
11. **The student** will prepare a 30-minute presentation summarizing their research product findings.
12. **The student** will present at the oral exam. The remaining exam time will be used for questions from the committee.
13. The committee will collectively determine the examination outcome.

Figure 4-4: Example Schedule for the individual research project qualifying exam option.



Exam Outcomes

The outcome of the exam is determined collectively by the examination committee choosing from four options: pass with distinction, pass, pass with remediation, or fail. The committee weighs both parts of the exam (written and oral) at its discretion when determining the outcome. The chair is responsible for communicating the outcome of the exam and delivering feedback from the committee to the student after the exam.

At the discretion of the student's committee, students who fail can retake the examination within six (6) months. Students who do not receive permission to retake the exam are dismissed from the Ph.D. program. After two (2) unsuccessful attempts, the student is automatically dismissed from the Ph.D. program.

Forms

- ***Engineering School's Recommendation and Certification of Doctoral Advisory Committee:*** This form is due to an SIE Student Services Coordinator at least two weeks before the scheduled examination.
- ***Engineering School's Report on Ph.D. Exam*** and ***SIE Ph.D. Qualifying Exam Assessment:*** These forms are sent to the chairperson of the committee by the SIE Student Services Coordinator to be completed and returned to them after the exam.
- ***Academic Requirements Report from SIS:*** The student brings one (1) copy for each committee member to the oral exam.

Dissertation Proposal

Formulation of a dissertation proposal is a key step toward completion of the Ph.D. This milestone allows a student's committee to make three important determinations:

1. To assess whether the student's knowledge of their chosen area and their understanding of relevant literature is adequate to complete a Ph.D.
2. To recommend coursework, approaches/techniques and other resources that would facilitate or enhance the proposed work.
3. To evaluate whether the proposed work, if completed, would constitute an acceptable basis for a doctoral dissertation.

Selection of a Ph.D. committee is an important component of the dissertation proposal process, insofar as the committee is responsible for helping the candidate navigate their path to the Ph.D. The Ph.D. committee approves a candidate's plan of study, including coursework, teaching, dissertation proposal and the final dissertation. SIE faculty place high value on interdisciplinarity and crosscutting collaborative research. Accordingly, we are firmly committed to letting each student work with their research advisor to select a committee that best supports their scholarly and professional development. Ph.D. candidates must adhere to the committee composition rules set by SEAS and the department. The requirements are outlined below:

- ***SEAS Requirements:*** The final dissertation committee must include at least three (3) Engineering School faculty with four (4) total UVA faculty and five (5) total members; one (1) of the UVA members (the external member) must be from outside SIE. At least three (3) of the dissertation committee members must have non-zero appointments in SIE.
- ***SIE Courtesy faculty member policy:*** Courtesy faculty members appointed by SIE may serve as the primary advisor of a Ph.D. student. Courtesy faculty members, other than the primary advisor, can count towards either an internal or external member.
- ***SIE Committee composition rules:*** Final committee composition should consist of no fewer two (2) SIE faculty members with greater than fifty (50) percent appointment. The committee chair should also have a primary appointment in SIE.

Finally, it is strongly recommended that the dissertation proposal committee consist of all five (5) faculty members that would be on the final defense; however, it is acceptable for a dissertation proposal committee to have four (4) instead of five (5) members, in which case the fifth person is added before the final defense.

The dissertation proposal consists of a written document and an oral presentation. The written document should discuss the proposed work, contributions, results to date, and research timeline concisely. Proposal documents should not exceed fifteen (15) single-spaced pages (or thirty (30) double-spaced pages). The bibliography and any appendices (appendices are not required to be read by the student's committee) are not included in this page limit. Significant departures from these guidelines must be approved in advance by the student's proposal committee. The written proposal document must be submitted to the committee at least two (2) weeks before the proposal presentation.

All members of the committee evaluate the proposal and generate a preliminary assessment of the candidate's achievement of the following research skills: a) identifying relevant problems of interest, b) interpreting existing literature, c) generating hypotheses, d) collecting data (via experiment, observation, modeling and/or simulation), e) interpreting results and drawing conclusions, f) communicating results (in oral and written formats), g) answering questions and defending their work, and h) commenting/critiquing on the work of others.

The oral defense of a dissertation proposal is advertised to the department. All interested parties are welcome to attend. The candidate gives a brief overview (20-30 minutes) of their proposed research, then takes questions from the audience and their committee. The committee then deliberates and decides whether the candidate has passed. In this way, the emphasis of the dissertation proposal will be on supporting student growth, rather than just deciding who

passes/fails. Candidates who fail the exam must take it again within six (6) months. The chair of the candidate's committee takes the lead in identifying an appropriate format and timeline for the second-chance defense. Students who do not pass on their second attempt are dismissed from the Ph.D. program.

It is the candidate's responsibility to email the SIE Student Services Coordinator their announcement information which consists of the committee members list with the chair and advisor identified, the meeting date, time, and location information, and the dissertation proposal title and abstract at least two (2) weeks before the proposal. The SIE Student Services Coordinator will provide the student with the information regarding the proposal defense forms, ideally the day before so the forms can be initiated and sent to the chair before the proposal defense starts. The chair completes that forms based on committee feedback and assessment.

Reiterating from Section 4.4 and Table 4-2, SIE students typically complete their proposal milestone at the end of Year 2, or the end of Year 3 if they enter the Ph.D. without an M.S. A revised Recommendation and Certification of Doctoral Advisory Committee form should be submitted to the SIE Student Services Coordinator no later than two (2) weeks before the scheduled proposal defense if the student has revised their committee since their qualifying exam and/or have added the fourth committee member. Proposal defenses are typically scheduled from March through June.

Final Defense

The final dissertation defense is the culminating step of the Ph.D. process. This milestone's main objective is to confirm that the completed research constitutes a meaningful contribution to the body of knowledge in the student's field of study. A secondary objective is to ensure that the written quality of the final document is adequate to highlight the value of the work and make it accessible for an educated audience. Often, there are intermediate meetings with the committee between the proposal and the defense to discuss various, dissertation-related topics.

Students are eligible to defend their dissertation once they have completed all other requirements, including the publication requirement. The final defense committee must have five members. There is no required format for the dissertation. Rather, the candidate should work with their committee to prepare a satisfactory document. The candidate should circulate the final dissertation to their committee no later than two (2) weeks before the oral defense date. Final defenses are advertised within the SIE and Engineering School. All interested parties are welcome to attend. The candidate gives a brief overview (thirty to thirty-five minutes) of their dissertation research. The candidate then takes questions from the audience and their committee. The committee deliberates and decides about whether the candidate has passed.

It is the candidate's responsibility to email the SIE Student Services Coordinator their announcement information which consists of the committee members list with the chair and advisor identified, the meeting date, time, and location information, and the dissertation defense title and abstract at least two (2) weeks before the final defense. The SIE Student Services Coordinator will provide the student with the information regarding the final defense forms, ideally the day before so the forms can be initiated and sent to the chair before the final defense starts.

The chair completes the forms based on committee feedback and assessment.

Ph.D. candidates must apply for graduation in SIS at the beginning of the semester in which they're expected to graduate. In addition, after successful completion of the final defense, the candidate must submit the dissertation via Libra (see Graduation Procedure) and complete the Survey of Earned Doctorates.

4.4. Academic Progress

Good academic standing is defined as a minimum cumulative grade point average of 3.0 and Satisfactory grade(s) in research and in teaching, when applicable. Unsatisfactory work during any semester or a cumulative grade point average of less than 3.0 may be considered a sufficient reason for withdrawal of financial assistance or for enforced withdrawal from the graduate program. Non-degree and visiting graduate students are also expected to maintain a minimum cumulative grade point average of 3.0 to remain in good academic standing.

Graduate students may incur academic probation any fall or spring semester in which they fail to maintain a minimum cumulative grade point average of 3.0. Students on academic probation have one semester to increase their cumulative grade point average to 3.0 or above, or they will be placed on academic suspension.

Students who do not raise their GPA to 3.0 during academic probation will incur academic suspension. Academic suspensions may be appealed within thirty (30) days of notification to the UVA Engineering Graduate Studies Committee. Without an approved academic suspension appeal from this committee, students are permanently academically suspended from the School of Engineering and are not eligible for readmission. Approved academic suspension appeals from the UVA Engineering Graduate Studies Committee provide the student a prescribed number of semester(s) of academic probation to increase their cumulative grade point average to 3.0.

4.5. Administrative Forms

It is important that graduate students submit administrative forms related to degree requirements promptly to the SIE Student Services Coordinator. These forms can be found on the Engineering School's webpage for current engineering graduate students.

A. Faculty Eligibility for MS/PhD Advisor and Committees

Faculty eligible to be on MS/PhD committees

- General Faculty (AGF: research, teaching, practice; all ranks [with a PhD])
- Tenure Track Faculty (all ranks)
- Research Scientists (all levels with a PhD)
- Special cases not listed above must be approved by the appropriate Program Chair.

Faculty eligible to be a MS/PhD Advisor

- Any faculty with a joint appointment in SIE (at any % > 0).
- Courtesy faculty with an active appointment in SIE.
- Special cases not listed above must be approved by the appropriate Program Chair.

NOTES

1. The advisor must be UVA faculty, so for example not a member of the Professional Research Staff (research scientists, senior scientists, principal scientists, etc.), not a Lecturer, and not a visiting faculty.

2. "Faculty" for all committees includes any faculty status and includes faculty-qualified SIE research and teaching members (e.g., research scientists and lecturers that hold a Ph.D.).

3. All committees must follow UVA and SEAS guidelines, see: https://records.ureg.virginia.edu/content.php?catoid=62&navoid=5418#committee-requirements