Materials Science and Engineering Graduate Student Manual*

Virginia Polytechnic Institute and State University
Blacksburg, VA

*Revised: March 2020

1 Graduate Program Description

The Materials Science and Engineering (MSE) Department consists of faculty members working in ceramic engineering, metallurgy, polymer engineering, bioengineering, and related areas of mechanics, chemistry, physics and electrical engineering. The mix of available courses provide a balance between engineering and science, and research programs range from traditional to contemporary topics. Graduate degrees offered by the Department include the Master's of Engineering (M.Eng.), Master's of Science (M.S.), and Doctor of Philosophy (Ph.D.)

2 Degrees

2.1 Master of Engineering

The M.Eng. is a non-thesis degree is intended to produce graduates with the knowledge and skills needed for mid-level and advanced positions in industries related to materials engineering. It is a coursework program developed to provide students with sufficiently rigorous courses in Materials Science and Engineering to obtain and advance successful careers in materials applications. The program provides students with in-depth knowledge about the production of materials, the interplay between the properties of materials and the design of useful applications, the performance of materials, communications skills, and ethical issues related to the use of materials.

The MEng degree designation provides students with experiential learning through one of two routes: (1) a project and report associated with a capstone course sequence, or (2) a report associated with an independent project or industry project. To satisfy the requirement through route (1), students will work in small teams to define project goals, design a solution approach, implement and manage the completion of the project, and communicate the results through written and oral reporting. A total of 30 credit hours are required for this degree; between 3 and 6 of these hours are project work (MSE 5904), the remainder are course credits. Students typically complete this degree in 12 to 18 months.

2.2 Master of Science

The M.S. is a thesis degree intended to produce graduates with the knowledge and skills needed for mid-level and advanced positions in industries related to materials engineering and for entry-level positions in materials research and development. The program has been developed to provide students with sufficiently rigorous courses in Materials Science and Engineering to obtain and advance successful careers in the research, development, and application of materials. The program provides students with in-depth knowledge about the production of materials, the interplay between the properties of materials and the design of useful applications, the performance of materials, communications skills, and ethical issues related to the use of materials.

The MS degree provides students with the coursework and research practice necessary to apply an existing body of knowledge or technology to solve a well-defined problem. Through the

completion of a thesis, the program provides students with experiential learning in the planning, execution, and dissemination of the results through written and oral communication avenues. The degree requires the completion of 30 credit hours of work. Between 6 and 10 of these credit hours are on thesis research (MSE 5994). Most students spend two academic years completing the M.S. program of study.

2.3 Doctor of Philosophy

The purpose of the Ph.D. degree is to produce graduates with the knowledge and skills needed for advanced positions in industries related to materials science and engineering and for positions in materials research and development. The program has been developed to provide students with sufficiently rigorous courses in Materials Science and Engineering to obtain and advance successful careers in the research, development, and application of materials. The program provides students with in-depth knowledge about the production of materials, the interplay between the properties of materials and the design of useful applications, the performance of materials, communications skills, and ethical issues related to the use of materials.

The Ph.D. degree provides students with the coursework and research practice necessary to make an original research contribution or finding that reflects novelty, originality, and significance. Through the completion of a dissertation, the program provides students with experiential learning in the conception, planning, execution, and dissemination of the results through written and oral communication avenues.

The Ph.D. degree is intended for exceptional students who have a strong interest in scholarship and a desire to do independent research. This degree program is designed to be flexible to meet the broad interests of students and faculty. A master's degree is neither a prerequisite nor a requirement. However, many Ph.D. students complete the requirements for a master's degree while working toward the Ph.D. degree. The degree requires the completion of 90 credit hours of work; of these, at least 27 credit hours must be 5000-level coursework and at least 30 credit hours must be Research and Dissertation (MSE 7994).

2.3.1 Qualifying Examination

To become formal candidates for the Ph.D. degree, students must pass the Qualifying Examination for the Degree of Doctor of Philosophy. This examination is typically taken after the first year of graduate study. The student must have a minimum GPA of 3.0 to be eligible to take the Qualifying Exam. Please see the Graduate Coordinator for Student Guidelines for the Qualifying Examination.

The examination is based upon a student's defense of an original research proposal developed to solve a problem chosen by the student's advisory committee. Approximately 3 weeks are provided to prepare a written proposal the student then defends in an oral presentation to his or her committee. The student is expected to demonstrate proficiency in the general field of materials science as well as an advanced understanding of the fundamentals related to their individual proposal. It is recommended that students entering without a Materials Science B.S. degree familiarize themselves with the materials field by taking MSE 2034 or by reading an introductory

textbook such as W. Callister and Rethwisch's, "Materials Science and Engineering: An Introduction."

Students are evaluated on their ability to formulate a rational approach to solving the assigned problem as well as on their grasp of fundamental principles. Students who fail the Qualifying Examination on their first try are permitted one additional attempt.

2.3.2 Preliminary Examination

Upon satisfactory completion of the Qualifying Examination, students devote a major portion of their time to thesis research. When they have identified a potential dissertation topic (typically within 12 months of the Qualifying Examination), they prepare a written proposal that is distributed to their advisory committee at least two weeks prior to the exam date and then defended in an oral examination (the Preliminary Examination). The Preliminary Examination should establish the basis and goals for the student's proposed thesis research, and the student should demonstrate a firm understanding of the relevant literature.

Students who pass the Preliminary Exam are eligible to receive a Master of Engineering (M.Eng.) degree. However, the M.Eng. degree is not granted automatically. To request it, a student must: (a) file an M.Eng. Plan of Study, (b) fill out an Application for Degree form, and (c) have his or her committee members sign off on the M.Eng. exam card at the conclusion of the Preliminary Exam. In addition, the student must have taken, or be registered for, 3 to 6 credits of MSE 5904, Project and Report and the student must have already done one of the required seminar presentations in MSE 5015-16. The Ph.D. Preliminary Exam proposal will fulfill the M.Eng. Project and Report requirement, and the Preliminary Exam is accepted as the final exam for the M.Eng. degree. For the student's name to appear in the Commencement Bulletin at graduation, all the necessary forms must be submitted by a deadline set by the Graduate School (see Academic Deadlines).

2.3.3 Final Public Oral Examination

The final step in earning the Ph.D. is the satisfactory defense of the dissertation at the Final Public Oral Examination for the Degree of Doctor of Philosophy. This final examination typically occurs in the fourth or fifth year of graduate study and should be at least 6 months after completing the Preliminary Examination.

3 Curriculum

3.1 Graduate Fundamentals

MSE 5004: "Materials Science and Engineering Graduate Fundamentals" is a required 1-credit course intended for the student's first semester of study that introduces University resources and Department policies related to successful matriculation through the Materials Science and Engineering graduate program.

3.2 Professional Ethics Requirement

All incoming graduate students must attend an introduction to the Graduate Honor System (offered during Graduate Fundamentals seminar, see section 3.1) and complete the online course, "NSF Responsible Conduct of Research for Engineers," (RCR). The online course is created and maintained by the Collaborative Institutional Training Initiative (CITI) at the University of Miami. Students must complete the following RCR modules: Authorship, Collaborative Research, Conflicts of Interest, Data Management, Mentoring, Peer Review and Publication, Research Involving Human Subjects, Research Misconduct, and Whistleblowing and the Obligation to Protect the Public. The course is available to registered graduate students through the CITI website. Instructions for taking the online course are located here.

Once the online modules have been completed, students should print out a certificate of completion from CITI to demonstrate compliance with the Scholarly Ethics and Integrity Component in Graduate Education Policy. This certificate must be submitted to the MSE Graduate Coordinator, who will put it in the student's file. When a student subsequently submits a Plan of Study, the Graduate Coordinator will note the completion of the Ethics and Integrity Component Requirement.

3.3 Courses

The specific set of courses needed to complete a graduate degree in MSE agreed upon by each student in consultation with their advisor and advisory committee and documented on the student's "Plan of Study" form. Students are expected to take at least four 5000 level MSE courses that form the core of their area of study. Typical course schedules for Master's and doctoral students are shown in section 5.2.

A list of the graduate courses and the undergraduate courses approved for graduate credit that are offered by the Department is available under the MSE listing in the Graduate Catalog.

3.4 Seminar Requirement

All full-time graduate students must enroll (pass/fail) and participate satisfactorily in the graduate seminar course, MSE 5015-16 each semester they are resident at the Blacksburg campus. M.S. and M.Eng. students must present one seminar during the course of their studies; Ph.D. students must present two seminars during their tenure. Seminar presentations at other schools/departments and/or conference talks may not be substituted for presentations in the MSE graduate seminar course.

4 Administration

The graduate program in the Materials Science and Engineering Department is administered by a Graduate Committee headed by a Graduate Chair, and a Graduate Coordinator. Student records and various approval forms are maintained by the Graduate Coordinator. The MSE Department Graduate Committee is responsible for selecting students for admission, for reviewing the curriculum, and for setting program standards. The department head appoints members of the Graduate Committee. Current personnel are:

Department Head	D. E. Clark
Graduate Committee Chair	William Reynolds
Associate Department Head	Sean Corcoran
Graduate Coordinator	Kim Grandstaff

4.1 Admission

The application procedure and forms are available from the Virginia Tech Graduate School, Graduate Life Center at Donaldson Brown mail code 0325, Blacksburg, VA 24061 or through the Research and Graduate Studies home page: http://graduateschool.vt.edu/. MSE's specific application instructions are available on our website: http://www.mse.vt.edu. The Graduate Record Exam (GRE) is required for all foreign national applicants and U.S. applicants. International students whose first language is not English or who do not hold a baccalaureate degree from an English language university are also required to submit the results of the Test of English as a Foreign language (TOEFL) or the International English Language Testing System exam (IELTS). International students are required to undergo a process of certification of competence in English. Students who are native English speakers are exempt. Students who did not graduate from an English language university are required to take an English Placement Test administered by the Graduate School. This test must be taken at the beginning of a student's first semester of enrollment. Students who pass the test are certified as proficient. Students who demonstrate a need for remedial instruction will be required to enroll in a special English course immediately. This course is counted as a regular part of a student's course load, and successful completion constitutes certification. International students currently enrolled for advanced degrees at other American universities are not usually admitted to the University until they have completed their degree requirements. No international student will be permitted to register for classes prior to receiving a Certificate of Eligibility (I-20 AB or IAP-66) and approval from the Immigration Service to attend Virginia Tech.

4.1.1 Types of Admission

Admission to graduate study at Virginia Tech is granted by the Graduate School on the recommendation of the Department Graduate Committee. The student may be admitted into one of the following categories:

Regular Student A student with a grade point average (GPA) of 3.00 or higher (on an A = 4.00 basis) and whose academic background is adequate and current may be admitted with regular status. An entering student must have demonstrated competence by completing a Bachelor's degree program in a field of engineering or science at a recognized university. Students not having adequate background in fundamental subjects, such as chemistry, mechanics, materials, mathematics, and physics will be expected to take make-up courses in the areas of their deficiencies.

Provisional Student for an applicant whose GPA is below the requirement and/or whose academic background is deficient or not current, provisional student status is allowed for no more than the equivalent of two semesters (12 credit hours of coursework is equivalent to one semester)

during which time the provisional student must earn a GPA of at least 3.00. Provisional students with a GPA of 2.75-2.99 will be eligible for financial assistance with departmental approval. Upon completion of no fewer than 12 credit hours of coursework, the student's graduate advisory committee may recommend that the student be admitted to regular status. International students are not eligible for consideration for admission as provisional students. **Commonwealth Campus Student** Commonwealth Campus status is open to an applicant who holds an earned bachelors or higher degree from a regionally accredited U.S. university. Examples of students who seek admission into the Commonwealth Campus program include those who (a) may qualify for regular admission but do not currently wish to work for a graduate degree; (b) do not qualify for admission because of a poor undergraduate record and wish to improve their credentials; (c) need to update their academic credentials after several years of professional experience or (d) require graduate courses for professional certification. International students in F1 or J1 visa status are not eligible for Commonwealth Campus status. However, some other types of visa status may allow non-degree enrollment (note that TOEFL score requirements do apply). Students in Commonwealth Campus status are not eligible for graduate assistantships. Commonwealth Campus students are limited to 12 credits of coursework while in this status. Students may not earn a graduate degree while enrolled in Commonwealth Campus status. Students enrolled as Commonwealth Campus students who later decide to pursue a graduate degree at Virginia Tech must formally apply for admission to the Graduate School. The MSE Department has the discretion to determine whether courses taken as a Commonwealth Campus student can be applied toward a degree after subsequent admission to the Department's graduate degree program.

Non-Degree Status A student with a Bachelor's or higher degree who fully qualifies for admission to Graduate School (on a regular or provisional basis) but who:

1. does not currently desire to work toward a graduate degree, or
2. desires to transfer the credits for use toward a graduate degree at another institution

may be admitted with the non-degree status. Upon recommendation of the Department Graduate Committee, subject to the approval of the Dean of the Graduate School, credits earned as a "non-degree" graduate student may subsequently be used toward meeting graduate degree requirements. "Non-degree" graduate students are not eligible for financial assistance.

Undergraduate Students

Students in their senior year, with a 3.0 or better GPA, may enroll in 5000-level courses satisfying undergraduate degree requirements within their department with the permission of the course instructor and the Department Head. Should the student become a graduate student, these courses **may not** be used on the Plan of Study for a graduate degree. Students wishing to pursue graduate level degrees, whether at Virginia Tech or at another university, should consider Dual Student Status or the Accelerated UG/GR Degree.

Dual Student Status Seniors in a bachelor's degree program at Virginia Tech, who have a GPA of 3.0 or better may be eligible for Dual Status during the final semester of their undergraduate degree. To obtain this status, students must file an application for the master's degree and the Accelerated Undergraduate/Graduate Degree and Course Designation Form:

Graduate Student Forms. MSE reviews the student for master's acceptance and, if this is recommended, indicates that the student will be accepted for Dual Status for the final semester of the undergraduate degree. This acceptance must occur prior to the final semester of the undergraduate degree. Graduate coursework taken during the semester of dual registration may only be designated for use in the graduate degree when it is not used to meet bachelor's degree requirements (i.e., each course taken during the final semester is specified as being for either the bachelor's or the master's degree).

Accelerated UG/GR Degree Undergraduate students with a 3.3 or above GPA may apply for admission to the Graduate School upon the completion of 75 hours of undergraduate study.

The student submits the Application for Graduate Study online, and submits the Accelerated Undergraduate/Graduate Degree and Course Designation Form (available here: Graduate Student forms) to the MSE Graduate Coordinator. During the final two semesters of the student's BS degree, the student may complete up to 12 hours of graduate work, jointly enrolled as a graduate and an undergraduate student. These 12 credit hours of coursework will be counted toward both the B.S. degree and the master's degree. Students must receive a grade of B or higher in order for the courses to count for the graduate degree.

Students admitted to the Accelerated UG/GR program in MSE will be treated as non-thesis Master's (M.Eng.) students supported on their own funds. If they wish to pursue a thesis Master's degree (M.S.), they must find a faculty advisor willing to support their research, and upon completion of the B.S. degree, they can be considered along with the pool of entering graduate students for graduate assistantships.

4.1.2 Financial Support

Assistantships Graduate appointments with financial support are referred to as Graduate Assistantships. Graduate Assistantships are generally provided for M.S. and Ph.D. candidates but not usually for M.Eng. students. Assistantship offers are based upon the availability of funds and upon the academic qualifications and interests described in a student's application materials.

Upon accepting financial aid as a Graduate Assistant, a student is expected to perform assigned duties (a research project, grading for an instructor, assisting in a lab, etc.). Students on an assistantship are required to work a maximum of 20 hours per week. Each student will be evaluated continuously by the faculty member supervising his or her work. If the student's work performance is not satisfactory, upon due notice, his or her financial support may be discontinued. In addition, the student must maintain a GPA of 3.00 or better on all courses taken as a graduate student irrespective of whether or not the courses are listed on the plan of study. Financial support for summer school is handled on an individual basis. Financial support may be extended on a year to year basis, within the guidelines of the Graduate School upon mutual agreement of the student and project director or Department Head.

Fellowships/Scholarships The MSE Department encourages students to apply for externally-sponsored fellowships and scholarships to help defray their educational expenses. Funding for external fellowships can come from federal agencies or private foundations and they can confer some prestige to the recipient. Fellowships and scholarships sometimes target students from specific backgrounds or seek to encourage students to pursue particular research areas.

5 Degree Requirements

5.1 Student Responsibilities

Students are expected to be knowledgeable of and to comply with all University and Departmental graduate regulations as stated in this document (MSE Graduate Student Manual) and official publications such as the Graduate Catalog.

5.2 Credit Requirements and Typical Course Schedules

Master of Engineering in MSE		
Courses	Credit Hours	
	Min.	Max.
5000 level or higher	15	
Seminar [a]	1	1
Special/Indep. Study [b] (5984/5974)	---	9 total
4000 level [c]	---	6
Project and Report (5904)	3	6
Minimum Total [d]	30	---

Master of Science in MSE		
Courses	Credit Hours	
	Min.	Max.
5000 level or higher	12	
Seminar [a]	1	1
Special/Indep. Study [b] (5984/5974)	---	9 total
4000 level [c]	---	6
Research and Thesis (5994)	6	10
Minimum Total [d]	30	---

[a] Students are required to register for MSE seminar each semester of residence; the seminar credits cannot be counted toward the minimum number required in courses numbered 5000 and higher

[b] 5974 and 5984 may be used in meeting minimum requirements for courses numbered 5000 or higher. All courses should be listed on the Plan of Study by title, not "Special/Independent" Study.

[c] A maximum of 6 credit hours may be in 4000 level courses not approved for graduate credit.

[d] Up to 20% of the credit hours for the M.Eng. or M.S. degrees can be transferred. All transfer courses must have been taken for graduate credit with an earned grade of "B" or better. "Satisfactory" or "Pass" grades are unacceptable unless the course is only offered on a pass/fail basis.

Ph.D. in MSE		
Courses	Credit Hours	
	Min.	Max.
5000 level or higher [a]	27	
Seminar [b]	2	4
Special/Indep. Study [c] (5974, 5984, 6984)	---	12 of either, 18 total
4000 level, not appr. Grad. credit [d]	---	6
Research and Dissertation (7994)	30	
Minimum Total [e]	90	---

[a] Courses numbered 5000 or above may not be taken on a pass/fail basis except when offered P/F only.

[b] Students are required to register for MSE seminar each semester of residence; the seminar credits cannot be counted toward the minimum number required in courses numbered 5000 and higher

[c] 5974 and 5984 may be used in meeting minimum requirements for courses numbered 5000 or higher. All courses should be listed on the Plan of Study by title, not "Special/Independent" Study.

[d] A maximum of 6 credit hours may be in 4000 level courses not approved for graduate credit if outside the student's major field and if judged by the student's committee to be on a level warranting graduate credit.

[e] Up to 50% of the graded credit hours may be transferred upon approval of the Advisory Committee. Research hours counted toward a master's degree cannot be counted toward the Ph.D. All transfer courses must have been taken for graduate credit with an earned grade of "B" or better. "Satisfactory" or "Pass" grades are unacceptable unless the course is only offered Pass/Fail.

Example M.Eng. Course Schedule [a]		
1st Fall	**3 cr**	**MSE 5xxx (Your choice)**
	3 cr	**MSE5xxx (Your choice)**
	3 cr	**5xxx (Your choice)**
	1 cr	**MSE 5015 Seminar**
	2 cr	**MSE 5904 Project & Report**
1st Spring	**3 cr**	**MSE 5xxx (Your choice)**
	3 cr	**MSE 5xxx (Your choice)**
	3 cr	**4xxx/5xxx (Your choice)**
	1 cr	MSE 5016 Seminar
	2 cr	**MSE 5904 Project & Report**
2nd Fall	**5 cr**	**4xxx/5xxx (Your Choice)**
	1 cr	MSE 5015 Seminar
	2 cr	**MSE 5904 Project & Report**
	4 cr	MSE 5904 Project & Report [b]

Example M.S. Course Schedule [a]		
1st Fall	**3 cr**	**MSE 5xxx (Your choice)**
	3 cr	**MSE 5xxx (Your choice)**
	3 cr	**4xxx/5xxx (Your choice)**
	1 cr	**MSE 5015 Seminar**
	2 cr	**MSE 5994 Research & Thesis**
1st Spring	**3 cr**	**MSE 5xxx (Your choice)**
	3 cr	**MSE 5xxx (Your choice)**
	3 cr	**4xxx/5xxx (Your Choice)**
	1 cr	MSE 5016 Seminar
	2 cr	**MSE 5904 Project & Report**
2nd Fall	**1 cr**	**4xxx/5xxx (Your Choice)**
	1 cr	MSE 5015 Seminar
	6 cr	**MSE 5994 Research & Thesis**
	4 cr	MSE 5994 Research & Thesis [b]
2nd Spring	1 cr	MSE 5016 Seminar
	11 cr	MSE 5994 Research & Thesis [b]

[a] **boldface** courses are required and apply toward minimum credit requirements for the degree.
[b] these additional research credits are not needed to reach the minimum credit requirements for the degree, but they may be necessary to maintain full-time student status (12 credits for students on assistantships, 9 credits for self-supported students). Students may take up to 18 total credits per semester.

Example Ph.D. Course Schedule [a]		
1st Fall	**3 cr**	**MSE 5xxx (Your choice)**
	3 cr	**MSE 5xxx (Your choice)**
	3 cr	**4xxx/5xxx (Your choice)**
	1 cr	**MSE 5015 Seminar**
	2 cr	**MSE 7994 Research & Dissertation[b]**
1st Spring	**3 cr**	**MSE 5xxx (Your choice)**
	3 cr	**MSE 5xxx (Your choice)**
	3 cr	**4xxx/5xxx (Your Choice)**
	1 cr	**MSE 5016 Seminar**
	8 cr	**MSE 7994 Research & Dissertation[b]**
2nd Fall	**9 cr**	**5xxx (Your Choice)**
	1 cr	**MSE 5015 Seminar**
	8 cr	**MSE 7994 Research & Dissertation[b]**
2nd Spring	**1 cr**	**MSE 5016 Seminar**
	15 cr	**MSE 7994 Research & Dissertation[b]**
3rd Fall	1 cr	MSE 5016 Seminar
	15 cr	MSE **MSE 7994 Research & Dissertation[b]**
3rd Spring	1 cr	MSE 5016 Seminar
	15 cr	**MSE 7994 Research & Dissertation[b]**

[a] **boldface** courses are required and apply toward minimum credit requirements for the degree.
[b] MSE 5904 or MSE 5994 research credits cannot be counted toward the Ph.D. degree. Students may take up to 18 total credits per semester. To be considered full-time, students on an assistantship must take at least 12 credits per semester; self-supported students must take at least 9 credits per semester.

5.3 Advisory Committee

As early as possible, and prior to completing 12 credit hours beyond the baccalaureate, each student must identify a faculty member who will serve as his or her major professor. The major professor will serve as the thesis/dissertation advisor and chairman of the student's advisory committee. Students are encouraged to confer with as many faculty members as possible before making this choice.

The function of the student's advisory committee is to approve the Plan of Study, provide advice, and periodically assess whether the student is making satisfactory progress toward a degree. The advisory committee for M.Eng. and M.S. students will be composed of a chair (who must be a Virginia Tech faculty member or research professor) and a minimum of two other faculty members. One of the three committee members must be either a member or adjunct members of the MSE Department. Additional committee members beyond the required faculty members may be drawn from industry. The advisory committee for students who have yet to select their own advisory committee is the Department Graduate Committee.

The advisory committee for Ph.D. students will consist of a chair (who must be a fulltime faculty or research professor affiliated with the MSE Department) and three other faculty members. At least two committee members must be full-time, research, or adjunct faculty affiliated with the MSE Department, and the committee must include faculty from at least one department other than MSE.

5.4 Plan of Study

All graduate students must submit an approved Plan of Study. The Plan must meet the minimum requirements for the degree being sought and must be approved by the student's advisory committee and the Graduate School. For master's students, the plan should be submitted before completing 12 credit hours of study of Virginia Tech; for Ph.D. students, the plan of study should be submitted before completing 20 credit hours beyond the baccalaureate degree or 12 hours beyond the master's. Students should obtain a Plan of Study Form from the MSE Graduate Coordinator, fill it out after consulting with their advisor and advisory committee, obtain the signatures of their advisor and advisory committee members, and submit it to the MSE Graduate Program Chair. The Graduate Program Chair will check that degree requirements are satisfied and have the plan submitted electronically to the Graduate School for final approval.

Transfer credits from other institutions are approved by including them on the Plan of Study; they must be accompanied by a catalog description of the course(s) and a transcript indicating the grades(s) received.

A change in the Plan of Study is necessary whenever the student's course of study deviates from the original plan approved by the advisory committee. Plan Change forms are available on the Graduate School's web page: Graduate Student Forms. A change in the plan of study is also required to change members of the student's advisory committee. A form for this purpose is available on-line as well.

5.5 Doctoral Residency Requirement

For detailed and up-to-date information on Virginia Tech's Doctoral Residency Requirement, please see "Credit Hour Requirements for Degrees and Certificates" under "Policies" in the Graduate Catalog.

5.6 Registration

Registration for classes can be completed until the deadline specified on the University Calendar. Pre-registration, which takes place the preceding semester, is done by selecting the courses to be taken though Hokie Spa. **It is important to pre-register. The MSE Department often cancels under-enrolled courses based upon pre-registration statistics.**

All graduate students who are fully supported on an assistantship, whether continuing or new, are required to register for no less than 12 and no more than 18 credits per semester. Graduate Assistants are not required to enroll during the summer. The required credits may consist of any combination of regular course credits and credits from variable credit courses (5904, 5974, 5984, 5994 or 7994).

5.7 Time Limit

Academic work, including transfer credit more than five years old at the time the Plan of Study is submitted, requires Justification for inclusion on the plan. The Justification form requires an Advisory Committee explanation of how the committee will insure that the student will update their knowledge for out-of-date courses. The Course Justification Request form can be found here:

Graduate Student Forms. Justifications remain valid throughout the degree unless the student is out of enrollment for a period exceeding one calendar year. Justification of "old" coursework and review of the Plan of Study occurs at the time of re-admission.

5.8 Final Examinations

Graduate students must be registered at VT for at least the minimum number of credits (3 credit hours) in the semester or summer session when they take an examination required by Graduate School Policies and in the semester when a degree is completed. Students who have a thesis/dissertation ready for defense by the beginning of a semester, may schedule that defense early in the semester and qualify for Start of Semester Defense Exception (SSDE, 1 credit; see Start of Semester Defense Exception under Examinations and see Dates for Degree Completion at Academic Deadlines. Final exams should be scheduled through the Graduate School's approval portal: Graduate School Approval System. Each candidate for an M.S. degree must pass a final oral and/or a written examination. The examining committee will be composed of a minimum of three members. To pass the final examination, a candidate must have a favorable vote from a majority of the examining committee. If a student fails the final examination, there must be a lapse of one full semester (a minimum of 15 weeks) before rescheduling the examination. The student is allowed no more than two opportunities to pass the final examination.

The final examination for the Ph.D. is an oral defense of the dissertation and is administered by the advisory committee (four members must be present). This exam must be scheduled no earlier than six months after successful completion of the Preliminary Examination.

5.9 Academic Eligibility

The University requires that candidates for graduate degrees must maintain a 3.00 GPA computed over all courses taken at the University. A student who fails to maintain a 3.00 will be placed on probation by the Graduate School. The student must raise their average above 3.00 during the next academic semester to be removed from probation. Failure to regain regular status is grounds for dismissal. Failure to maintain a 2.0 average during any single semester is also grounds for dismissal. Transfer courses are not used to compute University or Departmental GPA.

5.10 Progress Toward Degree

Each student must consult with the Graduate Chair or the Associate Department Head and select an initial faculty advisor by the end of their first semester in the Department. The initial advisor is responsible for guiding the student to the appropriate academic resources during the period of time before the student has selected a regular faculty advisor (the chair of their Advisory Committee). The faculty advisor (initial or regular) is responsible for meeting with the student, typically at the beginning of the spring semester, to review the student's progress toward a degree. The Graduate Coordinator will provide students and advisors with a form to guide the annual review. Once a student's progress has been reviewed with the student, the review form should be returned to the Graduate Coordinator and filed with the student's academic records and the Graduate School.

The following tables indicate typical times required to reach the important benchmarks of the three graduate degrees.

M.Eng. Degree

Time Since Admission	Progress
0-6 months	Select project advisor, advisory committee
0-12 months	Submit Plan of Study
12-18 months	Submit Project Report

M.S. Degree

Time Since Admission	Progress
0-6 months	Select thesis advisor, advisory committee
0-12 months	Submit Plan of Study
12-18 months	Defend thesis dissertation

Ph.D. Degree

Time Since Admission	Progress
0-6 months	Select thesis advisor, advisory committee
0-12 months	Submit Plan of Study
12-18 months	Pass Qualifying Exam
18-24 months	Submit research proposal, pass Prelim Exam
36-48 months	Defend dissertation

6 Forms and Checklists

The following forms are important at various stages of the graduate student's tenure. All of the Graduate School's forms (with the exception of the Plan of Study Form, which may be obtained from the MSE Graduate Coordinator) are available through their web page: Graduate Student Forms.

Plan of Study Form This form identifies the student's graduate advisory committee and lists the courses the student has taken or plans to take to fulfill the requirements for their particular degree. It should be obtained from the MSE Graduate Coordinator (this particular form is not available from the Graduate School), filled out by the student, signed by the student's advisory committee, and returned to the MSE Graduate Coordinator. It then will be entered electronically in the Graduate School's database.

Independent Study Request Form Approval form required to enroll in an independent study course (available from the MSE Graduate Coordinator).

Request for Leave of Absence Used when studies are interrupted for a semester or more.

Application for Graduate Readmission For returning following a leave of absence.

Program Change Form This form is used to make course changes on a student's Plan of Study.

Change of Committee/Advisor Form This form is used to change advisors or committee members on a student's Plan of Study.

Request to Admit Candidate to Preliminary Examination Used by Ph.D. candidates to notify the Graduate School of the place and time of a student's preliminary exam and to obtain a committee signature card for the exam. This form is online only and can be accessed here: Graduate School Approval System.

Request to Admit Candidate to the Final Examination Used by M.Eng., M.S., and Ph.D. candidates to notify the Graduate School of the place and time of a student's final examination and to obtain a committee signature card for the exam. This form is online only and can be accessed here: Graduate School Approval System.

6.1 Thesis/Dissertation, Project Report Document

All M.Eng. project reports, M.S. theses, and Ph.D. dissertations advised by MSE Department faculty must be prepared according to the guidelines of the University's Electronic Thesis and Dissertation Initiative. The current guidelines and information on Thesis/Dissertation format are available here: Graduate Student Forms, and here: University Libraries ETD.

In the usual course of events leading up to a final defense, a student will assemble the publications and/or the chapters that will make up their thesis/dissertation document in the Graduate School's format, and send this draft to their advisor. Either concurrently or after the advisor's approval, the draft is distributed to the rest of the advisory committee for comment. This should be done well before the anticipated defense date – typically at least a few months earlier. After receiving feedback from the committee on the draft, the student is in a position to address comments and suggestions by filling gaps in the work and revising the document to produce a ***final draft*** of the thesis/dissertation. At this point, if the end is in sight, the student can communicate with their committee to find an agreeable date for the final defense. Once the committee has reviewed the final draft to ensure the earlier feedback has been addressed and the thesis/dissertation is finished, the student can request admission to the final defense from the Graduate School. **The request for admission to the final examination must occur at least two weeks before the defense date, so the committee must have approved the final thesis/dissertation document by this time.** Students should ask their advisor if they want a paper copy of the final version of the thesis or dissertation; the MSE Department does not require a paper copy.

The final version of the electronic thesis or dissertation (ETD) must be submitted to the Graduate School no later than two weeks after the successful completion of the final examination.

6.2 Graduation

Schedule Final Exam or Final Defense All graduate students must schedule a final exam or final defense. A form to schedule the final examination can be found online here: Graduate School

Approval System. **This must be done no later than two weeks prior to the date of the examination** to permit a complete clerical review and to ensure that all degree requirements have been satisfied. The Department office will prepare and distribute a public announcement of the examination.

Application for Degree This can be done online through Hokie Spa. A one-time charge of $25 is required. This must be completed by the dates posted on the Graduate School's website. If you do not apply for your degree on time, your name will not appear in the Commencement Bulletin and there will be a delay in receiving your diploma. If you expect to graduate within the next semester, please submit your application for degree as soon as possible.

Submission of Final Thesis/Dissertation/ Students have two weeks after the date of the exam to electronically submit their revised thesis or dissertation to the Graduate School. Please see the webpages, Graduate Student Forms and University Libraries ETD, for details. Please check with your advisor to see if he/she wants a paper copy of the final version of the thesis, dissertation, or report. If additional time is needed, the advisor will need to submit a request in writing to the Dean of the Graduate School indicating the reason and when the copies will be submitted.

Department Clearance Students must check in with the MSE Graduate Coordinator upon completion of their degree program. They are expected to return all building and lab keys, clean their office/lab areas, and complete an exit survey. Failure to do so may result in a delay in receiving final transcripts and/or diploma.

Statement of Completion If a statement is needed, a request can be submitted through your Hokie Spa account. Upon request, completion statements will be sent after all degree requirements have been met, including the submission of final copies of thesis, dissertation, or project report.

Record Review You can always check your progress toward degree any time during your graduate studies by visiting your graduate checklist on Hokie Spa. It is strongly suggested that all students stop by the Graduate School to verify that all records are complete before leaving campus. For more information on graduation procedures please contact Graduate School.