

Mechanical Engineering Graduate Program

POLICIES AND PROCEDURES FOR GRADUATE STUDENTS IN MECHANICAL ENGINEERING

This document is subject to revision. Changes are communicated via e-mail to current graduate students.

This document provides the basic information needed by graduate students in the Mechanical Engineering (ME) Department at Virginia Tech. It consists of the rules and procedures of the ME Department for the ME and Nuclear Engineering (NE) degrees, along with those of the Graduate School as found in the Graduate Catalog. If the answer to a question is not obtained from the Graduate Catalog or, these notes, the answer is sought by asking: the ME Graduate Academic Advisor, the research mentor, the ME Graduate Program Chair, then the Graduate School. Preferably, in that order. The intention of this document is to provide helpful information for graduate studies but, it is not an exhaustive resource. Note: The Graduate School has authority to change policies and procedures at any time.

Additional information on graduate study is found on the websites of the University, the Graduate School, and the ME Department.

ME Graduate Program Resources Offices in Blacksburg
104 & 105 Randolph Hall
E-mail: megrad@vt.edu

Dr. Corina Sandu, ME Graduate Program Chair
106 Randolph Hall
Ph: 540-231-7467
E-mail: csandu@vt.edu

Annette Ben-Tzvi, Graduate Coordinator & Academic Advisor
Graduate Program Resources
Applications, Advising: EES, & DMM students
104 Randolph Hall
Ph: 540-231-3608
E-mail: abentzvi@vt.edu

Mandy Collins, Fiscal Technician
ME Business Office
Payroll, Stipends, Tuition, Fellowships
456 Goodwin Hall
Ph: 540-231-5056
E-mail: mandamcg@vt.edu

Cathy Hill, Graduate Coordinator & Academic Advisor
Graduate Program Resources
Applications, Advising: BMNS & RADS Students
105 Randolph Hall
Ph: 540-231-7460
E-mail: hillcath@vt.edu

Allison Jones, NCR Program Coordinator & Academic Advisor
Recruiting, Applications, Advising: NRC & NE Students
Northern Virginia Center
Ph: (703) 538-3790
E-mail: arjones@vt.edu

Mechanical Engineering Graduate Program

Table of Contents

APPLICATION & ADMISSION DEADLINES

SPECIAL ADMISSIONS

ACCELERATED UG/G PROGRAM IN MECHANICAL & NUCLEAR ENGINEERING

DUAL APPLICATION

INTERNAL APPLICATIONS FOR Direct Ph.D/Ph.D.

GRADUATE HONOR CODE

REGISTRATION

SPECIAL AND INDEPENDENT STUDY COURSES

SELECTING A FACULTY RESEARCH MENTOR AND COMMITTEE

PLAN OF STUDY

TRANSFER COURSES

MECHANICAL ENGINEERING (ME) MASTERS PROGRAMS

MASTER OF SCIENCE THESIS PROGRAM

MASTER OF SCIENCE NON-THESIS PROGRAM

MASTER OF ENGINEERING PROGRAM (MEng, non-thesis)

ME DOCTORAL PROGRAM (Ph.D.)

NUCLEAR ENGINEERING (NE) PROGRAMS

NE M.S. PROGRAM

NE MEng PROGRAM

NE Ph.D. PROGRAM

EXAMINATION PROCEDURES

QUALIFYING EXAM

PRELIMINARY EXAM

FINAL EXAM

INTERNATIONAL PROGRAMS

ETHICS, DIVERSITY AND INCLUSION REQUIREMENTS

SEMINAR REQUIREMENT

GRADE REQUIREMENTS

APPROVED MATHEMATICS/STATISTICS COURSES

GRADUATE PROGRAM ANNUAL REVIEW

FUNDING

FINANCIAL OPPORTUNITIES

STIPENDS

OFFER LETTERS

CONTINUED SUPPORT

GTA ASSIGNMENTS

FELLOWSHIPS AVAILABLE

APPLICATION FOR DEGREE

THESIS AND DISSERTATION PREPARATION

THESIS/DISSERTATION SUBMISSION

OPERATIONAL NOTES AND POLICIES

FINAL CHECK

LIST OF FORMS FOR GRADUATE STUDENTS

Mechanical Engineering Graduate Program

APPLICATION & ADMISSION WINDOWS for the ME Department. *These are different than the Graduate School's deadlines.*

	FALL	SPRING
Domestic and international application deadline	Oct. 1 st – Jan. 5 th	June 1 st – Sept. 1 st
Admission Decision	~March 1 st	~Oct. 15 th
UG/G & Dual application deadline	April 1 st – May 1 st	Sept. 1 st – Oct. 1 st
Admission Decision	~June 1 st	~Dec. 1 st

SPECIAL ADMISSIONS IN DEPARTMENT OF MECHANICAL ENGINEERING

Accelerated Undergraduate/Graduate Degree

The goal of the Accelerated Undergraduate/Graduate Degree (UG/G) program in the Mechanical Engineering (ME) Department is to allow students with an appropriate background to contribute to their graduate degree, before the completion of their Bachelor of Science degree in the Virginia Tech College of Engineering (VT CoE). The UG/G program allows counting some classes towards the undergraduate degree and graduate degree(s), and facilitates students finding faculty mentors and research projects as early as possible. The UG/G program in the ME Department currently allows a student in the VT CoE Bachelor of Science (B.S.) majors to count a maximum of 12 hours of course work (under certain restrictions) towards both their VT CoE B.S. degree and graduate degree(s) in ME. VT undergraduates from other qualifying majors, outside the CoE, interested in pursuing a Nuclear Engineering graduate degree are eligible to also apply.

Virginia Tech undergraduate students, **who have completed 90 hours with an overall GPA of 3.5 or higher**, qualify for this program. Applications for the UG/G program are submitted prior to taking courses towards the graduate degree(s). Students must have at least one semester remaining in their B.S. degree program. UG/G students can apply a year, or a semester prior to completing their B.S. degree. The application window for a Fall start is April 1st through May 1st and for a Spring start it is September 1st through October 1st.

Mechanical Engineering UG/G Program Requirements

The UG/G program in ME is designed to both accelerate a student's time to completion of their graduate degree(s), and to facilitate a student's transition into the graduate program. In addition to counting some courses towards multiple degrees, the program is designed to pair students with initial graduate faculty to mentor them through both, course selection and research opportunities within the ME Department. *Initial graduate faculty can serve as the final graduate research mentor for a student but, it is not required.* The initial graduate faculty member serves to facilitate a student's transition to graduate school.

A faculty member must agree to serve as an initial graduate faculty mentor for students in the UG/G program. Students and faculty self-select, and students must directly contact faculty they identified with similar interests, to confirm their willingness to advise.

The UG/G student, in conjunction with both the initial graduate faculty mentor and the undergraduate academic advisor, selects up to 12 hours of courses in the last 12 months of the undergraduate program, to count towards the completion of the B.S. and graduate degree(s). Up to 6 of the 12 credit-hours on the UG/G course selection form are allowed at the 4000-level. Any 4000-level class included as a technical elective and not a 'required' course (for example, the required senior lab, ME4006, does not qualify) is acceptable. If a class is offered as a conjoint class at both the 4000 and 5000-level, UG/G students must take the 5000-level course. All graduate degree courses are taken A-F and students must receive a 'B' or, higher for the class to count towards both the B.S. and graduate degree(s). Once a student is accepted into the program, the student must maintain an overall GPA of 3.5 or above, to continue to qualify for the UG/G program. Only coursework, not research hours, count towards the undergraduate and graduate degree(s). UG/G students must follow the restrictions on the number of special and independent study courses listed in the Graduate Catalog.

Students are not eligible for assistantships in the ME Department until the B.S. degree is conferred. Upon completing the B.S. degree, the student must submit a FINAL Accelerated Undergraduate/Graduate Degree and Course Designation form before the transcript is updated by the Registrar's Office. *Students must re-submit this form regardless of their intention to complete the graduate program or, not.*

Mechanical Engineering Graduate Program

VT Mechanical Engineering UG/G Application and Admission Process

The Graduate Record Exam (GRE) is waived for UG/G students in the CoE. The application process requires two steps:

Step 1: Online Application. The student must specifically apply for the M.S. graduate degree program in ME Department. Since there is no specific 'UG/G' application option, the student must choose the M.S. degree option and select 'Virginia Tech Bachelor/Master' as the undergraduate institution. Application materials must include:

- 1) VT Transcripts – unofficial Hokie SPA transcripts are acceptable; applicant MUST upload the transcripts.
- 2) Three letters of reference (preferably one or more from VT ME or CoE faculty).
- 3) Resume.
- 4) Statement of Purpose/Personal Statement.
 - a) Why do you want to go to graduate school?
 - b) What are your career objectives?
 - c) What is your general research area of interest?
 - d) Have you identified an initial faculty mentor? (The answer to this question will not impact the admission recommendation.)

Step 2: After completing the online application:

Identify an initial graduate faculty mentor. If an initial graduate faculty mentor is not identified, contact the Thrust Area Coordinator in the research interest area(s) for course selection advice.

Submit the following form:

Accelerated Undergraduate/Graduate Degree and Course Designation. The student must complete the *proposed* list of classes on the UG/G course selection form prior to the face-to-face meeting with the initial graduate faculty mentor and obtain the approval signature.

Return in the Accelerated Undergraduate/Graduate Degree and Course Designation form to one of the Graduate Coordinators in Randolph Hall to complete the application process. All application materials are due no later than two weeks after the application deadline.

Upon approval of the application by the ME Graduate Admissions Committee, the department forwards the UG/G course selection form to the Graduate School for final approval. The VT Graduate School approves/disapproves admission of the student to the program. ***However, the student is considered an undergraduate for tuition purposes until the bachelor's degree is conferred. The student is admitted as a Regular Graduate student the term *after* the B.S. is complete.***

VT Mechanical Engineering Dual Application for M.S.

VT CoE seniors within the last semester of graduation, who have a GPA of 3.2 or better, may take graduate level course work to satisfy an advanced degree program, as dual registrants if admitted to the graduate program. Students follow the same application procedures as above and must submit an Accelerated Undergraduate/Graduate Degree and Course Designation form with the application materials. Students must apply and be admitted to the graduate program PRIOR to taking the graduate level course(s). These courses 'single count' to satisfy graduate degree requirements.

Ph.D. Internal Application Procedures

Students in the Mechanical or Nuclear Engineering M.S. program may apply for the **Direct Ph.D.** program after passing the Ph.D. Qualifying Exam in their first four semesters in the ME Department. Students must secure a Ph.D. mentor and return the Change of Degree Status form *prior to the end of the current semester* of enrollment along with a tentative Plan of Study.

Alternatively, internal applicants applying for the Ph.D. who recently completed or, are in the process of completing the Master's program, must secure a Ph.D. mentor and return the Change of Degree Status form *the semester prior to the*

Mechanical Engineering Graduate Program

completion of the M.S. along with a tentative Plan of Study form. Graduate students must return forms to one of the Graduate Coordinators to complete the application process. Students receive official approval and notification by the Graduate School of the department's recommendation.

GRADUATE HONOR CODE

The Graduate Honor System establishes academic integrity among graduate students. All incoming graduate students are notified of the honor code upon application to Virginia Tech. By accepting admission, students agree to comply with the Graduate Honor Code, which requires honesty and ethical behavior in all academic pursuits. The Graduate Honor System (GHS) upholds and enforces the Graduate Honor Code. The GHS exists to educate students and faculty about the Graduate Honor Code, to investigate and hear all cases referred to the GHS, and to impose a penalty when a student is found guilty.

Find additional information about the GHS by reviewing the Constitution of the GHS, which details GHS procedures, rights of accused students, and rights of referrers. The procedures in the Constitution are strictly adhered to in all GHS matters. The Constitution is found online in the Graduate Honor System web site. The Office of the Graduate School Ombudsperson provides additional resources for professional relationships, mediation and advocacy.

REGISTRATION

During the academic year, active students register online through Hokie SPA. Pay attention to pre-requisites during registration. Students must contact the instructor for force-adding if they do not have the pre-requisites. Any student pursuing any phase of the graduate program is expected to make continuous progress toward the degree, by enrolling in graduate credits each semester during the academic year, until completing all requirements. ***No minimum registration is required during the summer, regardless of the students' financial support. However, 3 credit-hours each summer term is considered full-time. If the student does not register for the summer and is funded, the Payroll office deducts FICA taxes during the summer months. If a funded student registers for summer, the mentor must approve the registration and notify the Fiscal Technician if tuition is paid by the assistantship.***

Full-time enrollment for graduate students, for the purposes of tuition and fees, consists of a minimum of 9 credit-hours during an academic year (fall & spring semesters). However, the Commonwealth of Virginia does not count students as full-time unless they are enrolled for at least 12 credits, and in most academic contexts, *12 credits are considered full time*. However, students funded by the ME Department (GTA, GRA, GA, or other similar funding) **are expected to enroll in 18 hours** of courses and/or research during the academic year *until required courses are complete*. This is to prevent students from dropping below the minimum 12 required, if they withdraw from too many courses. Students are often conducting research in the summer but are not registered for research credit. Enrolling in 'extra' research hours in the fall and spring 'makes-up' for the difference. (*Graduate research assistants and graduate teaching assistants are required by the Graduate School to register for a minimum of 12 and a maximum of 18 credit-hours during the academic year only.*) ***Once coursework is complete, graduate students with assistantships are only required to register in 12 total hours of research and seminar.*** However, as the tuition is the same for 9 credit-hours or more, the ME Department **requires** all graduate students with assistantships to continue to register for a total of 18 credit-hours of research and seminar per semester, unless this creates a conflict with requirements for financial aid scholarships. The minimum registration for unsupported students is 3 credit-hours unless they are under Start of Semester Defense Exception (SSDE), In Absentia Status Request, or Leave of Absence Request. ***Students CANNOT register themselves under SSDE, In Absentia or Leave of Absence; only the Graduate School can add those registration statuses.***

Students registering for thesis or dissertation hours must communicate with their major professor before registering, in order to determine the appropriate number of ME/NSEG 5904, 5994, or 7994 credits. When starting the degree, all M.S. students must complete 9 hours of ME/NSEG 5994. All subsequent research hours will be taken as ME/NSEG 7994. Please note that the MS Plan of Study (POS) should not list more than 9 or 10 credit-hours for research, out of the total of 30 credit-hours required for the degree. Please also note that the seminar credit-hours do not appear on the POS. For all graduate students, the required 2 credit-hour GRAD 5014 Academic Integrity and Plagiarism and 1 credit-hour ENGE 5984 Graduate Student Success in a Multicultural Environment must be on the POS but their credit-hours do not count towards the total number of credit-hours required for the respective degree. The number of credits are proportional to the level of activities devoted to the work undertaken. For example, a Ph.D. student working full-time on dissertation activities and taking no other course work, registers for the 1 credit-hour seminar and 17 hours of ME/NSEG 7994, for each of the fall and the spring

Mechanical Engineering Graduate Program

semesters. Direct Ph.D. (after passing the qualifying exam) and Ph.D. students will register only for ME/NSEG 7994 (not for ME/NSEG 7994) research hours.

Students enrolled in a Masters program must have a minimum of 3 courses from the VT Mechanical Engineering Department on their POS (ME or NSEG). PhD students must have a minimum of 5 courses from the VT Mechanical Engineering Department on their POS (ME or NSEG).

If registration is for the purpose of thesis/dissertation defense ONLY, unsupported students may request Start of Semester Defense Exception for only 1 credit-hour, if the defense is scheduled within the first five weeks of the academic term. **To qualify for SSDE, the thesis/dissertation is written, reviewed, and approved by ALL committee members prior to returning the form.** The Graduate School will enroll the student for 1 credit-hour upon completing the SSDE form *at least 3 weeks prior* to the defense. Students submit the Request to Admit Candidate to Final Exam *at least 2 weeks prior* to the defense. *Scheduling of defenses in between semesters is not allowed. Students registered for SSDE are ineligible to receive assistantships during the academic semester.* Students in SSDE can defend at any time during summer and can remain on an assistantship.

Students not enrolled do not have access to university facilities. In those extraordinary cases where enrollment is not continued, the student must request a Leave of Absence Request or In Absentia Status Request from the Graduate School. The student is required to apply for re-admission to the Graduate School. The 'Leave of Absence Request' and 'In Absentia Status Request' forms are available online and at the Graduate Life Center (GLC). *Students not enrolling during two consecutive academic year semesters and not requesting a Leave of Absence/In Absentia are dropped and must re-apply for admission as a new student.* Applications are evaluated by the departmental Graduate Admissions Committee in the same manner and with the same admission deadlines as for new applicants.

SPECIAL AND INDEPENDENT STUDY COURSES

Special and Independent Studies at the graduate level require a syllabus and method of evaluation and are allowed to meet degree requirements. Special Study courses are not offered on a recurring basis, but they are 'test' courses which are proposed as regular courses, if there is sufficient enrollment. The Request for Special Study form is available on the Registrar's web site and must be submitted by the instructor. Refer to the Graduate Catalog for the maximum hours of Special Study and/or Independent Study allowed to meet degree requirements. *A course description is required for approval towards the degree. See ME Graduate Coordinator for approval procedures before taking any Independent Study courses.*

Syllabi for special studies (ME/NSEG 5984 and ME/NSEG 6984) courses are submitted to the ME Graduate Office *at least one semester prior to the term the course is offered.* All ME special study syllabi are approved by the ME Graduate Chair and the College of Engineering before submission to the Graduate School. The course syllabi contains a distinctive title, major measurable learning objectives and grading method, not simply "Special Study." They are normally taken A-F with multiple enrolled students.

Syllabi for independent studies (ME/NSEG 5974) courses are submitted to the ME Graduate Chair *at least 30 days prior to the semester the course is offered.* All ME/NSEG 5974 syllabi are approved by the ME Graduate Chair and the CoE. The course syllabi must contain a distinctive title, major measurable learning objectives and grading method, not simply "Independent Study." Independent Studies are *only offered Pass-Fail* for only one enrolled student.

SELECTING A FACULTY RESEARCH MENTOR AND COMMITTEE

The appropriate Thrust Area Coordinator or the Graduate Program Chair will serve as a temporary mentor, at the beginning of the first semester of study, for those students who have not made prior arrangements. Mentors are not assigned to students; rather, there are mutual agreements between individual students and professors. Students should meet with several faculty to discuss their expectations of graduate students, before finalizing their mentor. Before registration for the second semester of study, each graduate student must confer with the members of the faculty and obtain the agreement of one of them to serve as the student's mentor. *Students are expected to take the initiative in selecting their mentor.*

When a student works as a Graduate Research Assistant (GRA), the faculty providing the research funding, normally serves as the mentor. The student and faculty should discuss the 'MECHANICAL ENGINEERING DEPARTMENT FACULTY/GRADUATE STUDENT MENTORING/ADVISING GUIDELINES'. The agreed upon expectations are signed and returned with the POS. A student's mentor provides guidance in defining the POS and in monitoring the student's research progress.

The student and his or her faculty mentor jointly select the other members of the Advisory Committee. The student is responsible for obtaining from those chosen, their agreement to serve. The mentor is a core faculty member in Mechanical Engineering, or an Affiliate Faculty in the ME Department and serves as the Committee Chair. A non-ME Faculty or, a non-

Mechanical Engineering Graduate Program

ME Affiliate faculty can co-chair an ME student with a core ME faculty member. Non-tenure Advisory Committee members must go through an approval process. The [Graduate Committee Service Approval](#) form is required for these individuals, and the Associate Department Head for Graduate Studies must approve the member on a case by case basis. Once approved, the documentation is sent to the Graduate School for final approval. For Nuclear Engineering degrees, the Chair or a co-chair should be a faculty member in the VT Nuclear Engineering Program.

The Advisory Committee for a Masters' candidate must consist of a minimum of three faculty members (i.e., Chair and two committee members), at least two of whom are core faculty in the ME Department (tenured, tenure-track, or approved professors of practice who hold at least a Masters' degree). The committee can have one member outside the ME Department, but it is not mandatory. The committee composition must be at least 2/3 VT faculty. Exceptions to these norms are approved by the Associate Department Head for Graduate Studies. The Advisory Committee for a Ph.D. candidate normally consists of a minimum of four faculty members (i.e., Chair and three faculty members), at least three of whom are core faculty in the ME Department (tenured, tenure-track, or approved professors of practice who hold a PhD degree) and one is outside the ME Department. The committee composition must be at least 2/3 VT faculty.

Any non-VT committee member is approved by the Associate Department Head for Graduate Studies and the Graduate School to serve on the committee. ME affiliates from VT will count towards the 2/3 VT faculty members but, not towards the mandatory ME core faculty members. *Affiliate faculty members cannot outnumber the ME faculty on the Advisory Committee.* Exceptions to these norms are approved by the Associate Department Head for Graduate Studies.

The student and the mentor are responsible for arranging meetings of the Advisory Committee at appropriate times. It is strongly recommended the Advisory Committee meets when the student is starting the research to discuss the undertaking. ***As a minimum, each student must arrange a meeting with the Advisory Committee at least once per semester.*** The Advisory Committee must meet at least one other time when the student and the Chair feel a significant portion of the research is complete. Each student must meet with her/his mentor *regularly* to discuss the status of the graduate program and research. If a student enrolls in ME/NSEG 5904, 5994, or 7994 and fails to meet with the mentor in the semester, the student will receive no credit for those research hours.

Please note, as the degree program proceeds, the Advisory Committee and POS may change. Copies of the [Change of Committee-Advisor](#) and [Plan of Study Change forms](#) are available on the Graduate School's web site. Once the POS is approved by the Graduate School, any changes require *all* committee members (old and new if there are any) to approve the changes using the same procedure followed when submitting the original POS. Students must submit these forms PRIOR to the term the change is to take effect.

PLAN OF STUDY (POS)

Departmental policy requires students to submit a [Plan of Study](#) (POS) during their first or second semester, depending on the degree sought. A Masters student entering in the Fall semester, must submit the POS by December 1st. A Ph.D. student entering the Fall semester must submit their POS by May 1st. (Corresponding dates pertain to students entering in the spring term.) *Note this submission date is one semester earlier than required by the Graduate School.* This early submission helps the students proceed with their degree in a timely manner and facilitates planning of course offerings within the department. Students failing to do this will find their registration is blocked. The POS must meet departmental and Graduate School requirements in effect for the designated degree at the time the plan is submitted. *A POS is only official when all courses are listed, and the form is signed by the entire Advisory Committee.* The departmental degree requirements, facilities and course offerings are listed in the [Graduate Catalog](#).

The POS represents an educational contract between the student and the University. The Graduate School will use the POS in determining whether or not the student meets the graduation requirements when the [Degree or Certificate Conferral Request](#) is made. Please note, study plans may change as degree programs proceed. Copies of [forms](#) are available on the Graduate School's web site. Approval of changes to the POS, are required by *all* committee members, and the procedure followed is the same as for the original study plan, with the exception of using the Graduate School's [Plan of Study Change](#) form. It is important to keep study plans current. Changes in the number of research hours does not necessarily require a POS change form. Requests for changes in the POS are required *before* the requested change takes place. Retroactive change requests are not acceptable. ***Requested changes in plans of study are required by the course-add deadline during the semester for which the change is requested.*** Changes in the estimated dates for the Prelim or, Final exams does not require a POS change form.

A POS is determined between the student and his or, her mentor and approved by the Advisory Committee. Blank departmental forms for the [Plan of Study](#) are available on the ME web site. The student makes and keeps a personal copy.

Mechanical Engineering Graduate Program

The student then gives the signed POS to the Graduate Coordinators and it is logged in for departmental approval. Approved POSs are then entered electronically on the BANNER system. Ultimately, the POS is acknowledged by the Graduate School and approved on Hokie SPA. After four to six weeks, the student must check Hokie SPA to see if the Graduate School approved the POS.

It is highly recommended that students take 5000-level courses instead of 4000. Any 4000-level class included is a technical elective and not a required course (for example, the required senior lab, ME4006, does not qualify). *No 4000-level courses are permitted on a nuclear engineering graduate degree POS.* If a class is offered as a conjoint class (offered at both the 4000 and 5000-level), students must take the 5000-level course. Students must take all graduate degree courses A-F (unless only offered P/F). Failure to submit the official POS in a timely fashion will result in a 'HOLD' placed on the students' accounts, blocking registration. Again, a ***POS is only official when all courses are listed and signed by the entire Advisory Committee, approved by the Associate Department Head for Graduate Studies and by the Graduate School.***

TRANSFER COURSES

Transfer courses are not automatically pre-approved. They are approved on the POS by the Advisory Committee. A sample of page 4 of the POS is below. A maximum of 50% of graded course work is transferrable from another university, in which the student was enrolled as a graduate student. *Students who had undergraduate status at the time they took graduate level courses cannot transfer those courses.* All courses to be transferred must have graduate level (5000 or above), achieved a 'B' or better, and were not used to complete the B.S. degree. The documentation consists of course descriptions and/or syllabi, in addition to the official transcript. See the Graduate Catalog for more details and procedures to transfer courses.

MECHANICAL ENGINEERING COURSE TRANSFER APPROVAL FORM

Student's Name: Jane Doe ID Number: Jan. 25, 2099

School where courses were taken: Georgia Tech

*****Attach copy of transcript(s) and at least one of the two: course description or course syllabus for each transfer course.**

Course No.	Transfer Course Name	Semester/Year Taken	Course Grade*	Equivalent VT ME Course	Dept. Use Only
					Approved (yes / no)
AE 6451	Electric Propulsion	Spring 2098	A	No equivalent Course	Yes
AE 6766	Combustion I	Spring 2098	B+	ME 5214 - Combustion	No
AE 6009	Viscous Fluid Flow	Spring 2098	A+	Partially with ME 5404 Fluid Dynamics & ESM 5514 Viscous Flow	Yes

*****A maximum of 50% of graded course work may be transferred from another university. All courses must be graduate level and have a "B" or better and cannot have been used to complete the B.S. degree.**

Committee comments: Although Jane as a sufficient grade to transfer AE 6766, ME 5214 is essential for her to take here for the research project.

Approval Signatures:

Isaac Newton
Advisor Signature

Head Honcho
Associate Department Head for Graduate Studies Signature

Marie Cuxi
Co-Advisor Signature

Mechanical Engineering Graduate Program

Expired Courses

Occasionally, students want graduate courses older than 5 years considered on the Plan of Study. These courses are not automatically pre-approved. The Graduate School requires documentation using the Course Justification Request form for approval.

MECHANICAL ENGINEERING MASTER OF SCIENCE THESIS PROGRAM

- Requires a minimum of 30 technical hours and must include the following minimum requirements:
- 6 hours of ME 5994 Research and Thesis. (*After completing 9 hours of ME 5994, enroll in ME 7994. ME 7994 hours are **not** listed on the M.S. POS*)
- 20 total hours of approved technical coursework; those 20 hours must meet the following:
 - 15 hours at the 5000-level or, higher
 - 9 hours of ME Course Work
 - 3 hours ME Department-approved mathematics or, statistics courses
- A maximum of 6 hours of appropriate 4000-level courses – *no conjoint courses are allowed & the courses must be on the Technical Elective list for undergraduates.*
- Maximum of 6 hours for Special Study and/or Independent Study - *a course description is required for approval towards the degree.*
- No courses below the 4000-level are accepted for graduate credit.

Supporting Course Requirements: GRAD 5014 Academic Integrity & Plagiarism (2 hours) and ENGE 5984 Graduate Student Success in a Multicultural Environment (1 hour)

An expected date for completing the Final Exam (semester/year) must appear on page 2 of the Plan of Study. ALL committee signatures are required on the last page for submission as an official POS ready for final approval. See the following sample:

Doe John James 99999999 12/01/2099
 (Last Name) (First) (Middle) ID Number Date this plan was submitted

Check Degree: MENG (30+hrs) MS non-thesis (30+ hrs) MS (30+ hrs) DUAL VT-TUD MS(58-59+) PHD (90+ hrs)
SEE YOUR ADVISOR, THE GRADUATE CATALOG & THE ME GRADUATE STUDIES GUIDE FOR SPECIFIC REQUIREMENTS AND RESTRICTIONS.

MUST BE TYPED: Please follow all instructions presented in footnotes.

Year when taken	Semester when taken	Dept & Course Number ¹	Course Title	Total Hours	Final Grade	Transfer Institution ²
RESEARCH³						
		ME 5904 (For non-thesis)	Project & Report (MENG & nt-MS)			NA
2101	Spring	ME 5994 (10hrs max.)	Research & Thesis (MS)	9	TBD	NA
		ME 7994 (30 hours min.)	Research & Dissertation (PhD)			NA (Do not put "extra hours" on Masters' POS)
5000 level courses^{4,5,6}						
List all courses used to meet degree requirements even if they have not been completed yet.						
2098	Fall	ME 5034	Bio-Inspired Technology	3	A	VT UG/G Program
2098	Fall	ME 5174 <u>omechanics of</u>	Biomechanics of Crash Injury Prevention	3	B	VT UG/G Program
2099	Fall	BMES 5154G	Advanced Commercialization of Biomedical	3	TBD	
2100	Spring	BMES 5184	Injury Physiology	3	TBD	
2099	Fall	STAT 5615	Statistics in Research	3	TBD	
4000 level courses^{4,5}						
List all courses used to meet degree requirements even if they have not been completed yet.						
2099	Spring	ME 4344	BIOLOGICAL TRANSPORT PHENOMENA	3	B+	VT UG/G Program
2099	Spring	ME 4534	LAND VEHICLE DYNAMICS	3	A	VT UG/G Program
Supporting courses⁴						
Supporting courses are not used to meet degree requirements. The two listed below must be met by Grad School requirement.						
2099	Fall	GRAD 5014	Academic Integrity & Plagiarism	2	TBD	
2100	Spring	ENGE 5984	Graduate Student Success in Multicultural <u>Egy.</u>	1	TBD	

¹ See the Graduate Catalog to find correct course abbreviations. https://secure.graduateschool.vt.edu/graduate_catalog/courses.htm
² A final grade of "B" or better MUST be earned for each transfer. An original transcript must be on file with the Graduate School for each transfer course. Course titles & numbers must exactly match the official transcript.

Mechanical Engineering Graduate Program

Doe John James 999999999 12/01/2099
 (Last Name) (First) (Middle) ID Number

Total research semester hours (maximum of 10 hours of ME 5994 for MS)	9
Total graduate course hours, 5000 level and above (excluding research hrs.)	15
Total course hours, 4000 level	6
Total approved Mechanical Engineering hours	12
Total approved Math/Stat hours	3
Total semester hours transferred	0
Total Virginia Tech semester *course* hours	24
TOTAL hours on POS (Might not match hours above)	33

Out-of-Date Courses Revalidated* Yes Not Applicable

***All courses on the Plan of Study more than five years old at the time the POS is submitted must be revalidated. Provide the [Course Justification Request form](#) (https://graduateschool.vt.edu/content/dam/graduateschool_vt.edu/GAAPforms/Course_Justification_Request.pdf) with the Plan of Study. The Graduate School restricts the number of Independent (5974) and Special Study (5984) courses used on the POS. NO 4974 courses allowed on the POS. Refer to the [GRADUATE CATALOG](#) for further information.**

For further information on ME Departmental requirements, refer to the [GRADUATE CATALOG](#).

Dates:

1. Expected date of Final Defense: Spring 2101
2. Expected date of PhD Qualifying Examination or result: N/A
3. Expected date of PhD Preliminary Examination: N/A

Doe John James 999999999
 (Last Name) (First) (Middle) ID Number

Signatures: John J. Doe jjdoe@vt.edu
 (Student Signature)

Jonathan Boryeko 111111111 11/15/2099
 X (Chair Signature) (Print Name) VT 90 ID# (Date)

Alex Untariou 222222222 11/15/2099
 (Co-Chair Signature) X (Member Sig.) (Print Name) VT 90 ID# (Date)
 (check appropriate title)

Tom Diller 333333333 11/16/2099
 (Member Signature) (Print Name) VT 90 ID# (Date)

MECHANICAL ENGINEERING MASTER OF SCIENCE NON-THESIS PROGRAM

The non-thesis M.S. (nt-M.S.) program seeks to educate graduate engineering students by providing them with preparation in the essential sciences and technology of ME. This option complements our current offerings and provides potential graduate students with another opportunity to meet their needs better than the M.S. with thesis option. The nt-M.S. program involves academic course work, a research component related to coursework, or a review of research papers and concludes with a final presentation to the Examination Committee. The purpose is to ensure a research component is preserved through this M.S. degree program. This degree option is more applicable for those applicants who are interested in part-time studies, who are employed and pursuing professional development or, careers in industry. Departmental funding is not available for the *non-thesis* programs. This program does not require research hours but does require more technical coursework (24).

The nt-M.S. in ME must include the following requirements. Approved technical coursework meeting the following minimum requirements: **24 hours minimum**

1. Project and Report (ME/NSEG 5904): **1-6 hours**
2. Courses numbered 5000 or, higher: **18 hours minimum**
3. ME Coursework: **9 hours minimum**
4. ME approved mathematics or, statistics: **3 hours post baccalaureate**
5. A **maximum** of two VT 4000-level courses are allowable to meet degree requirements from the ME Technical Elective List for undergraduate ME students (no 4000-level courses are allowed on the POS for NSEG graduate students). If it is a conjoint course, the 5000-level version is required.

Mechanical Engineering Graduate Program

6. A **maximum** of 6 hours of Special Study (ME/NSEG 5984 only), and a **maximum** of 6 hours of Independent Study (5974 only), with the total of both not to exceed 9 hours is allowed.

Supporting Course Requirements: GRAD 5014 Academic Integrity & Plagiarism (2 hours) and ENGE 5984 Graduate Student Success in a Multicultural Environment (1 hour)

Transfer courses meeting Graduate School policies, are listed and approved on the Plan of Study.

MECHANICAL ENGINEERING MASTER OF ENGINEERING PROGRAM

The Master of Engineering Degree (MEng) is primarily intended for people working in industry/government and pursuing a graduate degree on a part-time basis. Because it requires more coursework and less research, departmental funding is not available. The MEng degree does not lead to the Ph.D. degree program. MEng candidates submit a final Project Report to the Advisory Committee. The 30 technical course hours degree requirements are:

1. A minimum of 6 hours of ME 5904; Project and Report.
2. A minimum of 24 hours of courses
3. A minimum of 3 hours of ME approved mathematics or, statistic courses.
4. A minimum of 18 hours of courses numbered 5000 or, higher.
5. A minimum of 6 hours of courses outside the student's discipline area.
6. A maximum of 6 hours of approved courses numbered at the 4000-level. (No 4000-level courses are allowed on the POS for NSEG graduate students)

Supporting Course Requirements: GRAD 5014 Academic Integrity & Plagiarism (2 hours) and ENGE 5984 Graduate Student Success in a Multicultural Environment (1 hour).

An expected date for completing the Final Exam (semester/year) must appear on page 2 of the POS. ALL committee signatures are required on the last page for submission as an official POS ready for final approval. See the following sample:

Mechanical Engineering Graduate Program

Doe John James 999999999 12/01/2099
 (Last Name) (First) (Middle) ID Number Date this plan was submitted

Check Degree: MENG (30+hrs) MS non-thesis (30+ hrs) MS (30+ hrs) DUAL VT-TUD MS(58-59+) PHD (90+ hrs)
SEE YOUR ADVISOR, THE GRADUATE CATALOG & THE ME GRADUATE STUDIES GUIDE FOR SPECIFIC REQUIREMENTS AND RESTRICTIONS.

MUST BE TYPED: Please follow all instructions presented in footnotes.

Year when taken	Semester when taken	Dept & Course Number ¹	Course Title	Total Hours	Final Grade	Transfer Institution ²
RESEARCH³						
2101	Spring	ME 5904 (For non-thesis)	Project & Report (MENG & nt-MS)	6	TBD	NA
		ME 5994 (10hrs max.)	Research & Thesis (MS)			NA
		ME 7994 (30 hours min.)	Research & Dissertation (PhD)			NA (Do not put "extra hours" on Masters' POS)
5000 level courses^{4,5,6}			List all courses used to meet degree requirements even if they have not been completed yet.			Please indicate if courses listed below were used to meet the Accelerated Undergrad program (UGG/Dual)
2098	Fall	ME 5034	Bio-Inspired Technology	3	A	VT UG/G Program
2098	Fall	ME 5174	Biomechanics of Crash Injury Prevention	3	B	VT UG/G Program
2099	Fall	BMES 5154G	Advanced Commercialization of Biomedical	3	TBD	
2100	Spring	BMES 5184	Injury Physiology	3	TBD	
2099	Fall	STAT 5615	Statistics in Research	3	TBD	
2100	Spring	STAT 5615	Statistics in Research	3	TBD	
4000 level courses^{4,5}			List all courses used to meet degree requirements even if they have not been completed yet.			4000 level courses carry no graduate credit. Limited to 2 courses. Must be on the ME Tech. Elective list.
2099	Spring	ME 4344	BIOLOGICAL TRANSPORT PHENOMENA	3	B+	VT UG/G Program
2099	Spring	ME 4534	LAND VEHICLE DYNAMICS	3	A	VT UG/G Program
Supporting courses⁴						Supporting courses are not used to meet degree requirements. The two listed below must be met by Grad School requirement.
2099	Fall	GRAD 5014	Academic Integrity & Plagiarism	2	TBD	
2100	Spring	ENGE 5984	Graduate Student Success in Multicultural Eng.	1	TBD	

¹ See the Graduate Catalog to find correct course abbreviations. https://secure.graduateschool.vt.edu/graduate_catalog/courses.htm

² A final grade of "B" or better MUST be earned for each transfer. An original transcript must be on file with the Graduate School for each transfer course. Course titles & numbers must exactly match the official transcript.

Doe John James 999999999 12/01/2099
 (Last Name) (First) (Middle) ID Number

Total research semester hours (maximum of 10 hours of ME 5994 for MS)	9
Total graduate course hours, 5000 level and above (excluding research hrs.)	15
Total course hours, 4000 level	6
Total approved Mechanical Engineering hours	12
Total approved Math/Stat hours	3
Total semester hours transferred	0
Total Virginia Tech semester *course* hours	24
TOTAL hours on POS (Might not match hours above)	33

Out-of-Date Courses Revalidated* Yes
 Not Applicable

***All courses on the Plan of Study more than five years old at the time the POS is submitted must be revalidated. Provide the Course Justification Request form (https://graduateschool.vt.edu/content/dam/graduateschool_vt_edu/GAAPforms/Course_Justification_Request.pdf) with the Plan of Study. The Graduate School restricts the number of Independent (5974) and Special Study (5984) courses used on the POS. NO 4974 courses allowed on the POS. Refer to the GRADUATE CATALOG for further information.**

For further information on ME Departmental requirements, refer to the [GRADUATE CATALOG](#).

Dates:

1. Expected date of Final Defense: Spring 2101
2. Expected date of PhD Qualifying Examination or result: N/A
3. Expected date of PhD Preliminary Examination: N/A

Mechanical Engineering Graduate Program

Doe	John James	99999999
(Last Name)	(First) (Middle)	ID Number
+ Signatures: <u>John J. Doe</u> jjdoe@vt.edu		
	(Student Signature)	
John Smith	<u>John Smith</u>	11111111
X (Chair Signature)	(Print Name)	VT 90 ID#
Annie Oakley	<u>Annie Oakley</u>	22222222
<input type="checkbox"/> (Co-Chair Signature), X (Member Sig.)	(Print Name)	VT 90 ID#
(check appropriate title)		(Date)
Amelia Earhart	<u>Amelia Earhart</u>	33333333
(Member Signature)	(Print Name)	VT 90 ID#
(Member Signature)	(Print Name)	VT 90 ID#
(Member Signature)	(Print Name)	VT 90 ID#
(Member Signature)	(Print Name)	VT 90 ID#

The Advisory Committee for Masters candidates normally consists of a minimum of three faculty members, at least two of whom must be core members in the Mechanical Engineering Department. The Advisory Committee for a Ph.D. candidate normally consists of a minimum of four faculty members, not more than three of whom are, core faculty in Mechanical Engineering Department. No more than one-third of the committee membership can be non-Virginia Tech faculty. □

MEng students must follow a similar examination procedures as nt-M.S. students; they submit a Project Report, instead of a thesis. The Project Report is not published; therefore, expectations of the written product are established by the mentor and committee at the beginning of the student’s graduate program. The Request to Admit Candidate to Final Exam is submitted AT LEAST 2 weeks prior to the defense of the Project Report.

MECHANICAL ENGINEERING DOCTORAL PROGRAM

Two semesters of full-time enrollment at the Blacksburg or other qualified VT Ph.D. campus are required to meet Ph.D. residency. There are exceptions which require prior approval from the Graduate School (i.e., designated programs at the Northern Virginia Graduate Center.) Doctoral students must complete a minimum of 90 semester credit-hours of technical graduate courses beyond the baccalaureate, including a dissertation. Ph.D. students submit a Plan of Study (POS) before completing the second semester registered as a Ph.D. student. Coursework from the M.S. degree may count toward the Ph.D. coursework, if approved by the Advisor Committee. The POS must meet the following requirements:

Requirements	Semester Credit-hours	
	Minimum	Maximum
Research and Dissertation (7994)	30	
Mechanical Engineering Courses	15	
Courses numbered 5000 or, higher	27	
**Courses numbered 4000		6
ME approved <u>Math/Statistics</u>	3	
Independent/Special Study Courses (5974 and 5984/6984)		12
Graduate Courses (**4000-level or higher)	30	

Mechanical Engineering Graduate Program

Supporting Course Requirements: GRAD 5014 Academic Integrity & Plagiarism (2 hours) and ENGE 5984 Graduate Student Success in a Multicultural Environment (1 hour)	3	
---	---	--

**If a course is conjoint, students must take the 5000-level version. 4000-level courses on the undergraduate Technical Elective list are allowed. It is highly recommended students always enroll in 5000-level courses. *Course credit-hours may change to fit an individual's program but, keep in mind students must have a minimum of 30 hours of technical course work (to include 3 credit-hours of math).* See sample POS next page:

MECHANICAL ENGINEERING PROPOSED PLAN OF STUDY

Doe John James
(Last Name) (First) (Middle)
999999999
ID Number
05/01/2099
Date this plan was submitted

Check Degree: MENG (30+hrs) MS non-thesis (30+ hrs) MS (30+ hrs) DUAL VT-TUD MS(58-59+) PHD (90+ hrs)
SEE YOUR ADVISOR, THE GRADUATE CATALOG & THE ME GRADUATE STUDIES GUIDE FOR SPECIFIC REQUIREMENTS AND RESTRICTIONS.

MUST BE TYPED: Please follow all instructions presented in footnotes.

Year when taken	Semester when taken	Dept & Course Number ¹	Course Title	Total Hours	Final Grade	Transfer Institution ²
RESEARCH³						
		ME 5904 (For non-thesis)	Project & Report (MENG & nt-MS)			NA
		ME 5994 (10hrs max.)	Research & Thesis (MS)			NA
2102	Spring	ME 7994 (30 hours min.)	Research & Dissertation (PhD)	60	TBD	NA (Do not put "extra hours" on Masters' POS)
5000 level courses^{4,5,6}						
List all courses used to meet degree requirements even if they have not been completed yet.						
2098	Fall	ME 5034	Bio-Inspired Technology	3	A	
2098	Fall	ME 5174	Biomechanics of Crash Injury Prevention	3	B	
2099	Spring	ME 5214	Combustion	3	TBD	
2099	Spring	ME 5254	Fuel Cell Systems	3	TBD	
2099	Spring	AOE 5024	Vehicle Structures	3	TBD	
2099	Fall	AOE 5124	Aero and Hydroacoustics	3	TBD	
2099	Fall	AOE 5204	Vehicle Dynamics & Control	3	TBD	
2099	Fall	AOE 5244	Optimization Techniques	3	TBD	
2100	Spring	STAT 5616	Statistics in Research	3	TBD	
4000 level courses^{4,5}						
List all courses used to meet degree requirements even if they have not been completed yet.						
2098	Fall	ME 4344	BIOLOGICAL TRANSPORT PHENOMENA	3	B+	4000 level courses carry no graduate credit. Limited to 2 courses. Must be on the ME Tech. Elective list.
Supporting courses⁴						
Supporting courses are not used to meet degree requirements. The two listed below must be met by Grad School requirement.						
2098	Fall	GRAD 5014	Academic Integrity & Plagiarism	2	Pass	
2100	Spring	ENGE 5984	Graduate Student Success in Multicultural Env.	1	TBD	

¹ See the Graduate Catalog to find correct course abbreviations. https://secure.graduateschool.vt.edu/graduate_catalog/courses.htm.
² A final grade of "B" or better MUST be earned for each transfer. An original transcript must be on file with the Graduate School for each transfer course. Course titles & numbers must exactly match the official transcript. Total course transfer hours must be the same or less than Virginia Tech course hours and course descriptions must be submitted with the POS as well. Transfer courses will appear ONLY on the POS. **VT UG/C courses are entered as transfer work.**
³ Indicate last Term & year you **estimate** you will complete the research and graduate.
⁴ All courses must be A-F unless only offered P/F. **No audit courses are allowed on the POS.**
⁵ Seminar cannot be used for degree requirements.

For Ph.D. students, an expected date for completing the Preliminary Examination (semester/year) must appear on page 2 of the POS, as well as the estimated date for the Ph.D. Qualifier & the Final Exam.

Mechanical Engineering Graduate Program

Doe John James 99999999 12/01/2099
 (Last Name) (First) (Middle) ID Number

Total research semester hours (maximum of 10 hours of ME 5994 for MS)	9
Total graduate course hours, 5000 level and above (excluding research hrs.)	15
Total course hours, 4000 level	6
Total approved Mechanical Engineering hours	12
Total approved Math/Stat hours	3
Total semester hours transferred	0
Total Virginia Tech semester *course* hours	24
TOTAL hours on POS (Might not match hours above)	33

Out-of-Date Courses Revalidated* Yes Not Applicable

***All courses on the Plan of Study more than five years old at the time the POS is submitted must be revalidated. Provide the Course Justification Request form (https://graduateschool.vt.edu/content/dam/graduateschool_vt_edu/GAAPforms/Course_Justification_Request.pdf) with the Plan of Study. The Graduate School restricts the number of Independent (5974) and Special Study (5984) courses used on the POS. NO 4974 courses allowed on the POS. Refer to the GRADUATE CATALOG for further information.**

For further information on ME Departmental requirements, refer to the [GRADUATE CATALOG](#).

Dates:

1. Expected date of Final Defense: Spring 2102
2. Expected date of PhD Qualifying Examination or result: Passed Fall 2098
3. Expected date of PhD Preliminary Examination: Spring 2101

Doe	John	James	99999999	
(Last Name)	(First)	(Middle)	ID Number	
Signatures: <u>John J. Doe</u>			<u>jjdoe@vt.edu</u>	
(Student Signature)				
John Smith (Core ME)	<u>John Smith</u>		11111111	4/15/2099
X (Chair Signature)	(Print Name)		VT 90 ID#	(Date)
Annie Oakley (Affiliate ME)	<u>Annie Oakley</u>		22222222	14/15/2099
X (Co-Chair Signature) <input type="checkbox"/> (Member Sig.)	(Print Name)		VT 90 ID#	(Date)
(check appropriate title)				
Amelia Earhart (Core ME)	<u>Amelia Earhart</u>		33333333	4/16/2099
(Member Signature)	(Print Name)		VT 90 ID#	(Date)
Mickey Mouse (Core ME)	<u>Mickey Mouse</u>		44444444	4/17/2099
(Member Signature)	(Print Name)		VT 90 ID#	(Date)
(Member Signature)	(Print Name)		VT 90 ID#	(Date)
(Member Signature)	(Print Name)		VT 90 ID#	(Date)

The Advisory Committee for Masters candidates normally consists of a minimum of three faculty members, at least two of whom must be core members in the Mechanical Engineering Department. The Advisory Committee for a Ph.D. candidate normally consists of a minimum of four faculty members, not more than three of whom are, core faculty in Mechanical Engineering Department. No more than one-third of the committee membership can be non-Virginia Tech faculty. □

**Attach approval form and resume for each non-Virginia Tech Committee Member: [Graduate Committee Service Approval](https://graduateschool.vt.edu/content/dam/graduateschool_vt_edu/GAAPforms/graduate-committee-service-approval-form.pdf) form (https://graduateschool.vt.edu/content/dam/graduateschool_vt_edu/GAAPforms/graduate-committee-service-approval-form.pdf)
 Faxed or scanned signatures are acceptable on all forms.**

Mechanical Engineering Graduate Program

NUCLEAR ENGINEERING (NE) M.S. PROGRAM

Earning an M.S. degree requires completing 30 technical credit-hours subject to the following conditions. Except as indicated, courses are taken for a grade, not Pass/Fail. M.S. students submit a Plan of Study before completing the first semester registered as an M.S. student. No grade below B- is allowed for any core course. A minimum of 21 graded credit-hours of technical courses require the following:

1. **Core Courses** (15 graded credit-hours) which include five required courses and one mathematics or, statistics course:

- (a) NSEG 5124 Nuclear Reactor Analysis
- (b) NSEG 5204 Nuclear Fuel Cycle
- (c) NSEG 5604 Radiation Detection and Shielding
- (d) either NSEG 5424 Reactor Thermal Hydraulics or, MSE 5384G Advanced Nuclear Materials
- (e) A minimum of 3 credit-hours of a mathematics or, statistics course from the approved list.

2. **Required Elective Courses:** Six credit-hours of any 5000 level or, higher science, engineering or, mathematics courses as approved by the Advisory Committee. However, if only six credit-hours of NSEG 5994 are applied toward the degree instead of nine credit-hours (see Research Requirements below), the student must take an additional 3 credits to satisfy the requirement for a total of 30 technical credit-hours for the M.S. degree.

The graded course work may include 5984/6984 Special Study. However, a student cannot exceed a maximum of 6 credit-hours of 5974 (Pass/Fail only), 5984, and 6984.

3. **Research Requirement:** Completion of a minimum of 6 credit-hours of NSEG 5994 Research and Thesis, not to exceed 9 credit-hours.

4. **Supporting Course Requirements:** GRAD 5014 Academic Integrity & Plagiarism (2 hours) and ENGE 5984 Graduate Student Success in a Multicultural Environment (1 hour).

NE MENG PROGRAM

Earning a MEng degree requires completing 30 technical credit-hours subject to the following conditions. Except as indicated, courses are taken for a grade, not Pass/Fail. MEng students submit a Plan of Study before completing the first semester registered as a MEng student. No grade below B- is allowed for any core course. A minimum of 24 graded credit-hours of courses including the following:

1. **Core Courses** (15 graded credit-hours) which include five required courses and one mathematics or, statistics course:

- (a) NSEG 5124 Nuclear Reactor Analysis
- (b) NSEG 5204 Nuclear Fuel Cycle
- (c) NSEG 5604 Radiation Detection and Shielding
- (d) either NSEG 5424 Reactor Thermal Hydraulics or, MSE 5384G Advanced Nuclear Materials
- (e) A minimum of 3 credit-hours of a mathematics or, statistics course from the approved list.

2. **Required Additional NSEG Course:** An additional 3 credit-hours of a graded NSEG 5000 level or, higher.

3. **Required Elective Courses:** Six credit-hours of any 5000 level or, higher science, engineering or, mathematics course as approved by the Advisory Committee. However, if only three credit-hours of NSEG 5904 are applied toward the degree instead of six credit-hours (see Project Requirements below), the student must take an additional 3 credits to satisfy the requirement for a total of 30 technical credit-hours for the MEng degree.

The graded course work may include 5984/6984 Special Study. However, a student cannot exceed a maximum of 6 credit-hours of 5974 (Pass/Fail only), 5984, and 6984.

Mechanical Engineering Graduate Program

4. **Project Requirement:** Requires a minimum of 3 credit-hours of NSEG 5904 Project and Report, not to exceed 6 credit-hours.

5. **Supporting Course Requirements:** GRAD 5014 Academic Integrity & Plagiarism (2 hours) and ENGE 5984 Graduate Student Success in a Multicultural Environment (1 hour).

NE Ph.D. PROGRAM

The 90 credit-hours are made up of (1) 30 graded technical credit-hours of coursework consisting of (1) seven core courses and four additional courses in the categories of NSEG 6000 level courses, Breadth or, Elective courses, (2) 30 credit-hours of research, and (3) 30 credit-hours of enhancement courses which may consist of either research credits or, graduate courses taken from any unit of the University. The minimum of 30 graded credit-hours of technical courses must include the following:

1. **Core Courses** (18 graded credit-hours) which include four required courses and two mathematics or, statistics courses:

- (a) NSEG 5124 Nuclear Reactor Analysis
- (b) NSEG 5204 Nuclear Fuel Cycle
- (c) NSEG 5604 Radiation Detection and Shielding
- (d) either NSEG 5424 Reactor Thermal Hydraulics or, MSE 5384G Advanced Nuclear Materials
- (e) A minimum of 6 graded credit-hours of a mathematics or statistics courses from the approved list of courses.

2. **6000-level NSEG Courses:** Any two NSEG 6000-level courses as approved by the Advisory Committee.

3. **Breadth Requirement:** An additional 3 credit-hours NSEG 5000-level or, higher graded course. This course provides some breadth in an area outside the student's specialization as determined by the student's Advisory Committee.

4. **Elective Course:** Three credit-hours of any science, engineering or, mathematics 5000-level or, higher course as approved by the Advisory Committee is required.

The graded course work may include 5984/6984 Special Study. However, a student cannot exceed a maximum of 12 credit-hours of 5974, 5984, and 6984.

5. **Research Requirement:** Successfully complete a minimum of 30 credit-hours of NSEG 7994 Research & Dissertation.

6. **Enhancement Requirement:** A minimum of 30 additional credit-hours consisting of a combination of either graduate coursework (5000-level or higher) from any unit of the University and/or research and dissertation credits (NSEG 7994), as approved by the student's Advisory Committee. These credits are tailored for the specific research topic and background of the student. Additional in-depth courses related to the student's research area, if applicable, are included under this requirement. Moreover, students who plan to enter academia after completion of their Ph.D. are encouraged to take electives such as GRAD 5104 Preparing the Future Professoriate and ENGE 5014 Foundations of Engineering Education. Those planning to enter industry are encouraged to take electives such as GRAD 5314 Future Industrial Professional in Science and Engineering. Obtaining a Graduate Certificate in the Future Professoriate or other areas is also encouraged. These electives will also satisfy part of the 30 credit-hours enhancement requirement.

7. **Supporting Course Requirements:** GRAD 5014 Academic Integrity & Plagiarism (2 hours) and ENGE 5984 Graduate Student Success in a Multicultural Environment (1 hour).

Mechanical Engineering Graduate Program

EXAMINATION PROCEDURES

Ph.D. QUALIFYING EXAMS (QE)

To continue in the doctoral program, students must pass the Ph.D. Qualifying Examination (QE) and have a graduate faculty research mentor. The QE assesses the student's potential to excel in Ph.D. studies and conduct high-level research. All students have two chances to pass the QE during their studies in the graduate programs in the ME Department. Passing is achieved when the student scores at least 75% in each of the three topics taken. A student may pass none, one, two, or all three topics in the first trial. In the second trial, the student only needs to register for and take as many topics (but not necessarily the same topics as the first time) as they did not pass in the first trial. Students are encouraged to take the QE as early as possible. The material covered in the ME QE is only from undergraduate courses. The material covered in NE QE will be detailed separately.

Students are notified of the Ph.D. Qualifying Examination details via e-mail. This examination is described in detail in the document, ***Announcement and Study Guide: Ph.D. Qualifying Examination***, published each semester and sent to enrolled students approximately two months in advance. All Ph.D. candidates must pass the examination to continue the program. M.S. candidates who have the intention of applying to the Ph.D. program, may also take the exam, as described below. The examination dates are typically set for two days at the end of October during the Fall semester and at the end of March for the Spring Semester. Refer to the ***Announcement and Study Guide: Ph.D. Qualifying Examination*** for further information when it is sent.

In **Mechanical Engineering**, the purpose of the QE is to ensure students have a broad mastery of undergraduate material, enough to serve as a basis for doctoral level research and scholarship. For the ME degree, it is an examination in three of seven topics (Controls, Fluid Mechanics, Heat Transfer, Machine Design, Mathematics, Thermodynamics, and Vibrations & Dynamics) to determine the mastery of topics at the advanced senior level. Students may also request a special topic under limited circumstances. A special topic is sometimes requested by those with a different background than the typical ME undergraduate from a course of comparable level. The special topic is requested in the Ph.D. Qualifying Exam form, stating the specific reasons for the request; the student and the mentor must both signed the form. The request is reviewed by the Ph.D. Qualifying Committee and the candidates are notified on a case by case basis on whether the request is approved or, not. If a student requests a special topic, the student *must* take that respective test.

In **Nuclear Engineering**, the purpose of the QE is to ensure students have a broad mastery of graduate material enough to serve as a basis for doctoral level research and scholarship. The exam can have two segments: a written part and an oral component. However, a student is exempted from the oral exam if the student receives a grade better than 75% in the two parts of the written segment. The oral segment is offered only to those students who receive at least a grade of 50% in the written segment. A written grade of less than 50% is considered a fail and the student must re-take the exam next time it is offered. Only portions with a grade less than 75% are re-taken. Descriptions of the two parts are given below:

- **Written Examination (6 hours)**

The written exam is comprised of two parts:

- Part 1: Math and NEP Core (choose 3 out of 5 questions) (3 hours)
- Part 2: NEP Specialty (3 questions) (3 hours) (each student chooses up to 3 specialty areas)

- **Oral Examination (1.5-2 hours)**

The oral examination will involve at least three (3) NEP faculty members; one of the faculty members must be the student's research mentor. During the oral exam, the faculty are encouraged to ask questions related to the written exam at least for the first hour of the exam. All the faculty are given equal chance to question students. The student's mentor monitors the exam.

Ph.D. Qualifying Examination for students entering the program with a B.S.

Students entering the ME graduate program with a B.S. must pass the exam in their first four semesters. NE students must pass the exam in their first five semesters with at least 18 credits of graduate course work earned. Once the exam is passed, the student may skip the M.S. and proceed to a Direct Ph.D. with approval of the faculty mentor, or they may finish the M.S. degree first and then continue with their Ph.D.

Mechanical Engineering Graduate Program

Ph.D. Qualifying Examination for students entering the program with an M.S.

Students entering the graduate program with an M.S. must pass the exam in their first three semesters.

Ph.D. Qualifying Exam for students who are not registered

Under special circumstances, students who are not currently registered graduate students in the ME Department may take the QE. Non-students who wish to take the exam, complete a Ph.D. QE form and provide a written request explaining the circumstances to the Chair of the Ph.D. Qualifying Committee exam no later than 5 weeks prior to the exam. The request is considered by the committee consisting of the Chair of the Ph.D. Qualifying Committee, the Chair of the Graduate Program Committee, and the Head of the Mechanical Engineering Department. The committee replies to the student within 15 days of receipt of the request. If the request is granted, the Chair of the Ph.D. Qualifying Committee will arrange for a faculty member to act as mentor to the student for purposes of the exam.

Appeal procedure

If a student doesn't pass the QE, the student may request re-grading of one or more problems. To do this, the student must complete a Ph.D. QE appeal form; the student and the mentor must sign the form confirming the re-grading request is reasonable. Re-grading is only allowed once for the same problems. The request is made within 30 days after the release of the scores to the students. For each problem for which re-grading is requested, the student must write a complete solution and a justification for the request. The originals and the complete solution and justification is returned to the Chair of the Qualifying Committee, together with the Ph.D. QE appeal form mentioned earlier, signed by the student and the advisor.

If a student fails to pass the QE in the required number of semesters and the required number of trials, a special request may be made for consideration of either extending the period to pass the exam or allowing another trial. The request should be made by the student to the Chair of the Ph.D. Qualifying Exam, supported by the student's advisor, with a written justification for requesting the exception. The case will be evaluated by a committee formed from the Chair of the Ph.D. Qualifying Exam, the Chair of the Graduate Program Committee, and the Head of the Mechanical Engineering Department.

If a student fails to pass the QE exam after all the allowed trials, the student can no longer be part of the Ph.D. program in the ME Department. In this case the student may finish and leave with another degree (not previously awarded at another university), or leave without any degree.

PH.D. PRELIMINARY EXAMINATION (PE)

The Preliminary Examination (PE) is an oral presentation given before the student's Examining Committee and is usually comprised of the Advisory Committee members. It is strongly recommended the student prepares a written description of his or her proposed research in the form of a dissertation prospectus and distribute it to the members of the Examining Committee one to two weeks in advance of the examination. The purpose of the PE is to determine if the student is prepared to undertake the proposed research. Therefore, it is expected the majority of the questioning will focus on the material contained in the dissertation prospectus, although the chair can modify the format of the examination at her/his discretion. *The Preliminary Examination is held after the student passes the Ph.D. Qualifying Examination and before the student makes significant progress on the dissertation research.* The student must pass the Ph.D. PE at least six months (preferably nine months to a year) before the final defense and at least one-third of the required work must remain after passing the PE.

The PE is scheduled through the Graduate School. *The Graduate School requires a minimum of two weeks advanced notice to schedule examinations.* Good academic status and an up to date Plan of Study, approved by the ME department and the Graduate School, is required before the Preliminary Examination is scheduled. The Request to Admit Candidate to Preliminary Exam form is available for scheduling the examination on the Graduate School's web site. The Graduate School will e-mail the Examining Committee to approve the exam. The Examination Committee must log onto the Electronic Signature Approval System (ESS) to record the results immediately after completion of the examination.

Passing the PE is needed for the Ph.D. student to continue in the program. If the Examining Committee considers appropriate, the student may not pass the exam and may have to retake it. At the discretion of the Examining Committee, even if the student passes the PE, the student may be asked to give another presentation to the committee after the PE and before the final exam.

Mechanical Engineering Graduate Program

FINAL EXAMINATION PROCEDURES

Each degree candidate will take an oral final examination, which will cover not only the student's research but also the general preparation in engineering. *The report/thesis/dissertation has to be distributed to the committee at least three weeks prior to the final examination. However, the committee can require more time to review the document.* Students must review the [Degree Completion and Commencement](#) information for deadlines and procedures.

The Final Examination is scheduled through the Graduate School. *The Graduate School requires a minimum of two weeks advanced notice to schedule examinations.* Good academic status and an up to date [Plan of Study](#), approved by the ME department and the Graduate School, is required before the Final Examination is scheduled. The [Request to Admit Candidate to Final Exam](#) for scheduling the examination is available on the Graduate School's [forms](#) web site. If registration is for [Start of Semester Defense Exception \(SSDE\)](#), the Graduate School registers the student for 1 hour and the defense occurs in the first five weeks of the term. ***To qualify for SSDE, the project/thesis/dissertation is written, reviewed and approved by ALL committee members prior to returning the form.*** The Graduate School will enroll the student in GRAD 6864/7864 (Master/Ph.D.) if they approve SSDE. Students must take into consideration their student loans and immigration status when applying for SSDE since, they are classified as less than half-time. *Students on assistantships and fellowships are required to register full-time during the academic year.* If the Graduate School does not approve SSDE, the minimum registration is three hours. Students must complete and return the [Start of Semester Defense Exception](#) form to the ME Graduate Program Resources Office for processing at least three weeks prior to the defense. *Examinations are only scheduled during regular academic sessions.*

The Examining Committee is approved by the Dean of the Graduate School and normally consists of the members of the student's Advisory Committee, although it is not necessarily so restricted. After approval by the Graduate School, the student, the Graduate Coordinator, the Graduate Program Chair, and the Examining Committee members are notified via e-mail approximately 5 days before the examination. *A proxy can attend in place of an Advisory Committee member who cannot attend the examination.* The absent faculty member must approve the Request to Admit Candidate to Final Exam and indicate the final examination grade on behalf of the proxy. ***The examination is NOT conducted if the Chair does not receive notification from the Graduate School that the examination has been approved.*** If the e-mail notification has not arrived two days prior to the examination, the student must contact the Graduate Coordinator and the Graduate School to determine if there is a problem to resolve.

Generally, the student is asked to make a brief (about 30-50 minutes) presentation to the Examining Committee, focused on the research conducted. At the discretion of the Examining Committee more general questions can also be asked.

Attendance to the final examination is open to other faculty members of professorial rank. *However, with the agreement of both the candidate and the mentor, others can be invited to attend the presentation segment only of the examination (for example the student's labmates, industry sponsors, etc).* Final defense candidates can be questioned first by invited attendees, after which these attendees are asked to leave the room. Then the Examining Committee asks the candidate questions. The next step is for the candidate to leave the room so the Examining Committee can deliberate. The committee decides whether the student passes or fails. If a student fails, the Examining Committee will indicate when the candidate may retake the examination. A repeat examination cannot be scheduled earlier than the beginning of the following semester. Once the exam is complete, the Chair of the Examining Committee inputs the results online and gives the SACS Accreditation Form to the appropriate ME Graduate Coordinator. The rest of the committee must also log in and approve the exam results.

INTERNATIONAL PROGRAMS

The Mechanical Engineering Department has international collaborations with the [Technische Universität Darmstadt](#), as well as [Thapar Institute of Engineering and Technology](#) in India.

Mechanical Engineering Graduate Program

ETHICS, DIVERSITY AND INCLUSION REQUIREMENTS

The Graduate School implemented 'Scholarly Ethics & Integrity' and 'Diversity & Inclusion' requirements for graduate students entering a new program. For more information, refer to the [Graduate Catalog](#). Students are required to enroll in a two credit-hours Ethics course (GRAD 5014) offered by the Graduate School in the first academic year. Ethics courses taken from other departments are approved to satisfy the Ethics requirement only on a case-by-case basis by the Chair of the ME Graduate Program. Students complete the Inclusivity requirement by completing Engineering Education's 1 credit 1 credit (ENGE 5984) *Graduate Student Success: Multicultural Engineering* course. The POS is not approved if the Ethics and Inclusivity requirements are not satisfied. *A student cannot schedule a preliminary or a final exam and cannot graduate without satisfying these requirements.*

SEMINAR REQUIREMENT

All full-time graduate students must enroll in the one credit-hour course ME 5944 Graduate Seminar during each semester while in residence at the Blacksburg campus. The seminar course does not have a regular meeting time or location. It is Pass-Fail (P/F) and *is not used to meet degree requirements*. All course details and requirements are communicated at the beginning of each semester. The purpose of this course is to encourage ME and NE graduate students to explore and grow their research interests by attending research seminars during the semester at Virginia Tech and, in the process, to engage with the local research community. Each semester the ME Department, as well as other departments, holds research seminars covering a broad range of exciting new developments in Science, Technology and Mathematics (STEM) which graduate students may choose to attend, if interested, to satisfy the course requirement.

GRADE REQUIREMENTS

Students must pass all courses on the POS with an average grade of 'B' or better. Students must repeat any subject with a grade below 'C-' if the course is on the POS. If a student's work is substandard, the ME Departmental Graduate Program Committee can recommend to the Dean of the Graduate School to drop the student from the Graduate School program.

All courses on the POS, including supporting courses, must be taken as a letter grade basis except for those courses offered on a P/F basis ONLY (such as all 5974 courses). Graduate students may take an unlimited number of hours of graduate work (5000 or, 6000 level) on a P/F basis outside of the department and not on the POS, with the approval of the faculty mentor. ***Auditing of courses is not recommended.***

MATHEMATICS AND STATISTICS COURSES

Approved courses to meet the departmental mathematics and statistics requirement:

Mathematics Courses

All 4000, 5000 or 6000 courses from the Mathematics Department are eligible to fulfill the departmental mathematics requirements except for MATH 4024, 4044, 4334, and courses numbered MATH 46XX and 56XX.

Statistics Courses

Selected 5000 and 6000 level courses from the Statistics Department are eligible to fulfill the departmental mathematics requirements. Those courses are STAT:

5104, -14, -24, 5204, 5304, -14, -24, -34, -44
5404, -14, -24, -34, -44, -54, -64, -74, -84
5504, -14, -24, -25, -34, -44, -54, -64, -74, -94
5605, -15, -16, -74
6105, -06, -14
6404, -14, -24, -64, -74, -94
6504, -14, -74

Mechanical Engineering Graduate Program

Engineering Courses

All courses cross-listed with the Mathematics Department and meeting the above requirements, are eligible for graduate mathematics credit. Any CGEP graduate level Math/Stat course is also acceptable.

Other acceptable engineering courses:

AOE 4084 Engineering Design Optimization
AOE 5434G Advanced Intro. to Computational Fluid Dynamics
BMES-5044/BSE-5044/CHE 5044 Engineering Mathematics
ECE 5605-06 Stochastic Signals & Systems
ESM 5734 Intro. to the Finite Element Method
ESM 5744 Variational Methods
ESM 6514 Computational Methods for Viscous Flow
ESM 6734 Finite Element Analysis
ME 5434 Adv. Intro. to Computational Fluid Dynamics
ME 5574/AOE & ECE 5774 Nonlinear Systems Theory
ME 5744 Methods of Mech. Engineering Analysis
ME 5764 Modeling MEMS & NEMS
ME 5774 Intro. to Stochastics
ME 6574 Adaptive Control Systems
ME 6744 Chaos and Nonlinear Dynamics
ME 6984 SS: Feedback Control of Dynamic Legged Locomotion
MSE 5124 Materials Optimization Through Designed Experiments
NSEG 5134 Monte Carlo Particle Transport

Approved Mathematics and Statistics Courses for Nuclear Engineering Degrees

MATH 5435 Principles and Techniques of Applied Mathematics
MATH 5465 Numerical Analysis
MATH 5474 Finite Difference Methods for Partial Differential Equations
MATH 5485 Numerical Analysis and Software
MATH 5495 Mathematical Methods in Engineering
ME 5744 Methods of Mechanical Engineering Analysis
ME 5774 Introduction to Stochastics
ME 6444 Verification and Validation in Scientific Computing
NSEG 5134 Monte Carlo Methods for Particle Transport
STAT 5104 Probability and Distribution Theory
STAT 5204 Experimental Design and Analysis I
STAT 5454 Reliability Theory
STAT 5615 Statistics in Research

GRADUATE PROGRAM REVIEW

Once a year, students and faculty mentors meet to review the students' progress towards the degree and provide a *written evaluation* for the students' academic files. This is in accordance with Policy Memo 229.

FUNDING

Funded students are REQUIRED to submit federal and state tax forms and the federal I-9 form PRIOR to beginning working. Proper forms of identification needed to fill out the I-9 form include: a valid driver's license, a social security card, a passport and/or a birth certificate, etc. The tax and I-9 forms are usually distributed during the mandatory orientation but, funding may begin in the middle of a semester. If this is the case, students must fill out all forms with the Fiscal Technician.

Mechanical Engineering Graduate Program

Students on assistantships and fellowships are required to register full-time, in a 18 credit-hours each semester, during the academic year, unless this creates a conflict with the requirements of a scholarship, in which case they will register for 12 credit-hours. All students, including funded students, are responsible for paying comprehensive fees and must do so before the Bursar's Office deadline to avoid a late fee penalty. Funded graduate students registered for any classes must not wait for a 'corrected' tuition bill before paying the comprehensive fees. Comprehensive fees and Parking Permits are payroll deductible. The Engineering and Capital fees are *not* payroll deductible.

FINANCIAL OPPORTUNITIES

1. Graduate Research Assistantships

Full-time Graduate Research Assistants (GRAs) are employed on a half-time basis (20 hours/week) on a research project during a specified appointment period. This is considered to constitute a 100% GRA position. GRAs are required to fulfill their employment obligations without regard to academic terms and holidays. This means, they are expected to average twenty hours of work per week between academic terms, too.

2. Graduate Teaching Assistantships

Full-time Graduate Teaching Assistants (GTAs) are employed on a half-time basis (20 hours/week) to assist with the teaching of undergraduate courses in the Mechanical Engineering Department. This is considered to constitute a 100% GTA position. GTAs are expected to report to the ME Department starting approximately one week before classes begin and continuing through final exams. Students are notified via e-mail how to apply for any open GTA positions. Offers are made to the graduate student(s) with the requisite skills needed and based on the needs of the undergraduate courses and laboratories that need GTAs. Students must successfully complete the Graduate School's mandatory GRAD 5004 GTA Training Workshop once.

3. Fellowship and Traineeship Holders

Fellowship and traineeship holders are full-time graduate students and have limited assigned university duties, specified by the fellowship/traineeship. Fellowship and traineeship holders must associate themselves with ongoing research projects and are treated like others who hold GRA positions. See Fellowship list.

4. Instructors

Additionally, doctoral candidates are occasionally employed as full- or, part-time instructors teaching undergraduate courses.

STIPENDS

Graduate assistantship stipends normally range from step 8 to step 14 for half-time (i.e., 20 hours/week) appointments during the academic year. Supplemental scholarships and fellowships, which depend upon the student's academic record, are also offered to qualified students. Students are notified if there is an application procedure for available scholarships and fellowships. The salary of instructors depends on their qualifications. The ME Department assumes the responsibility of paying the proportional amount of in-state tuition, engineering, library and technology fees, and health insurance (if it is purchased through the university) of all students supported on at least a 50% assistantship (i.e., 10 hours/week) on departmentally managed funds. Students MUST enroll in a minimum of 12-18 hours of courses and/or research as outlined above. The Graduate School waives the out-of-state portion for students with assistantships (NOT wages), who earn at least \$2,000 each semester.

OFFER LETTERS

Responsibilities relating to the assistantship and the details of the financial support are outlined in the offer letter from the department. GTAs receive subsequent contracts and assignments from the Graduate Program Chair and Assoc. Dept. Head for Undergraduate Studies approximately a week prior to classes. To maintain the assistantship during the specified period, students must complete their assigned duties in a satisfactory manner and make satisfactory progress toward their degrees.

Mechanical Engineering Graduate Program

CONTINUED SUPPORT

If continued support beyond the current offer is desired, the student contacts the faculty research mentor at least two months before the end of the support period indicated in the offer letter. Discuss details of financial support before finalizing the selection of a research mentor. Contracts are not continued without documentation by the mentor. US citizens and permanent residents are encouraged to fill out the [Free Application for Federal Student Aid](#) each Spring, as some available funding and fellowships are based on financial need.

GTA ASSIGNMENTS

The GTAs are intended to support the instruction of various core courses and laboratories for undergraduate students. GTA offers are extended by the department primarily to incoming graduate students in their first year of graduate studies in the ME Department. If GTA positions are unfilled, top priority is given to continuing Ph.D. students in their last term of enrollment. The next priority is Ph.D. students who passed the Ph.D. PE, followed by those who passed the Ph.D. QE and M.S. students who have indicated their interest and ability in the Ph.D. program by passing the Ph.D. QE. In addition, the type of past financial support of the students is also considered in ranking the students for GTA positions, with priority given to those previously supported primarily on research funding. Having the POS submitted is also considered. A few M.S. students are occasionally offered GTA positions based on the needs of the undergraduate courses covered.

A small sampling of fellowships available for graduate students in Mechanical Engineering is below:

Please note: Application deadlines and funding levels change from year to year.

External Fellowships

[ASME Graduate Fellowship & Scholarship Programs \(various\)](#)
[ASHRAE Scholarships & Graduate Students Grant-in-Aid](#)
[DOD SMART Fellowships](#) (deadline generally Dec.)
[DOE Office of Nuclear Energy Fellowships](#) (deadline typically Feb.)
[Edison Electric Institute](#)
[The Instrumentation, Systems, and Automation Society Scholarship](#)
[Link Foundation Energy Fellowship](#)
[NASA Graduate Student Researchers Program](#)
[National Defense Science and Eng. Graduate Fellowship](#) (deadline generally Dec.)
[NSF Graduate Research Fellowships](#)
[SAMPE Graduate Scholarship Award](#)
[Virginia Space Grant Fellowship](#)
[Whitaker International Fellows and Scholars Program](#)
[Yanmar/SAE Scholarship](#)

Diversity Fellowships

[Amelia Earhart Fellowship/Zonta International](#)
[American Association of University Women](#)
[ASME Graduate Fellowship & Scholarship Programs \(various\)](#)
[Clare Boothe Luce Program](#)
[Ford Foundation](#)
[GEM Program](#)
[NASA Graduate Student Researchers Program](#)
[NSF Minority Graduate Fellowships](#)
[SREB Doctoral Scholars Program](#)
[SWE Scholarships](#)
[The Olive Lynn Salembier Scholarship](#)

Virginia Tech Fellowships

See Graduate School's [Fellowship](#) links.
[Cunningham Doctoral Assistantships](#)
[Dean's Diversity Assistantships](#)

College of Engineering Fellowships

These are merit-based fellowships. No application is required; students are nominated by the ME Department:

Davenport Fellowship
Pratt Fellowship
Walts Fellowship

Mechanical Engineering departmental Fellowships

These are merit-based fellowships. No application is required.
Hord Research Fellowship
Ingersoll-Rand Fellowship
Mary V. Jones Fellowship

APPLICATION FOR DEGREE

The Application for Degree is filled out on [Hokie SPA](#). It is submitted by the [deadline](#) listed on the Graduate School's web site. Late submissions will result in the student's name not appearing in the Commencement Bulletin and possible delays receiving the diploma. Review the policies and procedures for completing the degree on the Graduate School's [What You Need to Graduate](#) website.

NOTES ON THESIS AND DISSERTATION PREPARATION

The intention of these notes is to aid in thesis and dissertation preparation, not to replace other instructions. Carefully read the Graduate Catalog produced by the Graduate School; it is the final word. These notes help in timing and writing, as well as clarify the role of the research mentor and committee. Note also, all M.S. theses and doctoral dissertations are submitted electronically (ETD). Separate ETD [instructions](#) are available on the Graduate School's web site.

COMPLETION OF RESEARCH

Some parts of the thesis and dissertation, such as the introduction and literature review, are written before the research is complete. The mentor and student reach an agreement early in the research, on work expectations. They then agree when the research is complete and ready to write. ***The thesis/dissertation is written and reviewed by all committee members before the final defense is scheduled.*** Students contact their Advisory Committee early in the process to find available day(s) and time(s) for the defense. *Requests to hold a final exam in less than two weeks is denied by the department and Graduate School.*

TIMING

Poor theses and dissertations result from improper timing more than from any other single cause. All too often, students do not start intensive work on their theses and dissertations until it is too late to do a good job. The result, at best, is a poor thesis or dissertation and a delay in graduation. The [Writing Center](#) is an excellent resource for students.

The major events in preparation and submission of the thesis or dissertation (see [Graduate Catalog](#)) are:

Mechanical Engineering Graduate Program

1. Outline to research mentor/committee chair -- this is the point where one begins writing, well ahead of the expected graduation date.
2. First draft to Chair (advisor) – anticipate a considerable amount of alteration.
3. Final draft to Chair – a complete draft includes title page, figures, etc. Misspelled words, typographical errors, poor construction, unnumbered pages, etc., make a draft unacceptable. Allow at least one week for the Chair to review and one week for corrections before submission to the Advisory Committee.
4. Thesis/dissertation to committee – A complete document printed in final format at least three weeks before the exam. *Please note the final document is reviewed by the Advisory Committee **before** agreeing on a final defense date.*
5. Verify the ETD is appropriately written and cited, using the [iThenticate system](#).
6. Final Exam – Scheduled during the academic term. The [Request to Admit Candidate to Final Exam](#) is submitted to the Graduate School office *at least two weeks before the exam*. Anticipate two weeks' time between the exam and submission of the final ETD for alterations.
7. Submission of final ETD to Graduate School Office -- no later than two weeks after the final oral examination.

RESPONSIBILITY

The thesis or, dissertation is the student's original work and thus it is the student's responsibility. The student must plan and write the thesis/dissertation, with some organizational help from the major professor. Students must take care with the word processing, proofreading, and checking of their analysis. If the candidate cannot handle this responsibility, the student cannot obtain a graduate degree. *It is not the responsibility of the mentor and the Advisory Committee to help write and proofread the thesis or dissertation.*

The major professor's role is one of *mentoring*. The advisor reviews the outline and successive drafts with the student and gives advice; not write, proofread, or check analyses. The mentor expects neat, readable copies from the student, with plenty of room for comments.

The other Advisory Committee members review the final copy only after it is approved by the major professor. They will read it for general technical content and level of endeavor, and approve, approve with revision, or disapprove of it before scheduling the final defense. They serve in an advisory capacity throughout the research, especially for a Ph.D. candidate.

Each graduate student is required to perform a self-evaluation each year for the activity done in the previous year (August-to-August). The student must first complete the self-evaluation and then pass it on to the advisor. The advisor will evaluate the student and send the form back to the student. This complete form, signed by the student and the advisor will then be uploaded by the student per instructions from the department. It is the student's responsibility to ensure that such an evaluation is done every year.

THESIS AND DISSERTATION FORMAT AND STYLE

A limited number of specific rules on format are covered in the [Graduate Catalog](#). Other rules are dictated by grammar and presentations of technical materials. There are many good books on style – '*The Elements of Style*' by Strunk & White and '*Plain Words*' by Sir Ernest Gowers are strongly recommended. Technical journals give some ideas of accepted practice but, these are papers, not theses/dissertations. Previous ETDs are available to browse in the [Digital Library & Archives](#). Discuss the format with the faculty mentor when completing the outline.

A technical thesis or, dissertation will normally include the following:

1. Title page (see [ETD Title page and abstract Word template](#)).
2. Abstract -- briefly describe the problem, the research program, and the main results.
3. Acknowledgments -- acknowledge help in the research and thesis or, dissertation preparation.
4. Table of Contents -- list section headings and page numbers.
5. *List of Figures -- list all figures with page numbers.
**Pay special attention to reproduced images, figures, etc. to meet copyright requirements. This often delays approval of ETD's, resulting in delayed graduation dates.*
6. Nomenclature -- define all symbols unless they are defined where they are used. Use standard symbols where possible. Give units of physical quantities.
7. Text.

Mechanical Engineering Graduate Program

- a. Introduction -- define and give the history of the problem, state the motivation and purpose of the research, and give a review of the literature. (If the literature review is long, use a separate section.)
 - b. Body -- includes separate sections for experiment (equipment and procedures), analysis, discussion of results, etc.
 - c. Conclusions and Recommendations -- summarize the main conclusions and make recommendations.
8. References.
 9. Appendix (if used).
 10. Vita is optional.

SUBMISSION OF THESIS/DISSERTATION TO GRADUATE SCHOOL

Note: Electronic submission of theses/dissertations ([ETDs](#)) is required. The final document is submitted within two weeks following the final exam to avoid SSDE registration the next term.

OPERATIONAL NOTES AND POLICIES

E-MAIL AND COMPUTING RESOURCES

Many important events and information are announced via e-mail. To access e-mail (using the popular Eudora, Google, Outlook, and NuPop packages for example) students need a Personal ID (PID). The [4 Help](#) web site contains many useful links and instructions. Students are responsible for removing themselves from any VT listservs by updating their Google account.

On the [College of Engineering](#) level, there is the [Advanced Research Computing](#) (ARC) which operates high-performance research computing. For more information on equipment and laboratories, visit their web sites.

ARC also operates high-performance workstations with the latest software systems for research and teaching in the VT CAD Laboratory, 114 E Randolph Hall. Contact: [Prof. Jan Helge Bøhn](#) for further information.

IT assistance is available through the [4Help website](#): <https://4help.vt.edu/sp> and the ME [Trouble Ticket](#) system: <https://me-trouble.mojohelpdesk.com/>.

BUILDING SECURITY

Building security is everyone's responsibility. Lock office and laboratory doors when leaving (even for a few minutes). *Careless building security creates theft victims!* In the evenings and on weekends, do not prop open building doors at any time. Do not bring personal items of value into the building. Students who compromise building security are required to turn in their building keys immediately.

KEYS

Building keys are issued to students at the discretion of their faculty mentor. The mentor e-mails the [Facilities & Operations Manager](#) with the request for keys and/or swipe card access to buildings. All keys issued to students are returned during their final check out. There is a monetary charge for each key not returned.

MECHANICAL WORK

Clearly define what is needed for Shop orders through the ME [Trouble Ticket](#) system. The orders are approved by the Primary Investigator (usually the research mentor) or, project leader. The [Shop Supervisor](#) assigns the work to an appropriate staff technician.

SHOP HOURS: M-F 8:00 am – 4:45 pm
STAFF TECHNICIANS: Phillip Long, Casey Lucas

Mechanical Engineering Graduate Program

PURCHASING, WORD PROCESSING, AND COMPUTER ACCOUNTS

Each faculty member works with an assigned staff support person to assist with purchasing, travel, and reimbursements. The research professor makes appropriate arrangements for these services on behalf of their students. *Departmental staff members are not available to do word processing for graduate students.* If a graduate student needs word processing done, which arises from a sponsored research project on which the student is working, the word processing is given to the research professor. The professor then submits it according to regular departmental procedures. *Only faculty and staff are authorized to use departmental letterhead in correspondence.*

EQUIPMENT AND INSTRUMENT CHECK-OUT

Equipment needed for research and teaching activities are signed out at the Instrument Shop window, Room 5 Randolph Hall. *Graduate students are personally responsible for equipment signed out.* Ending or, borrowing of equipment between graduate students is prohibited. Instructional activities of the department have precedence over research activities for short term instrument use, except when the instrument is specifically purchased for research use.

A FINAL CHECK

Students write an itemized list of all equipment, books, computer programs, keys, etc., and return all to the Facilities & Operations Manager. It is strongly suggested all students stop by the Graduate School's Programs and Clearances Office, in the Graduate Life Center, to verify all records are complete, *before leaving campus*. For more information on [graduation procedures](#), please contact grads@vt.edu, Phone: (540) 231-8636 Fax: (540) 231-3714.

GRADUATE FORMS

ALL paperwork is processed through the ME Graduate Program Resources Office, 104-105 Randolph Hall and the Northern Virginia Center for those in the National Capital Region. Students make a copy of all forms for themselves. An electronic copy of the forms is kept in the academic file in the ME Graduate Program Resources Office. ***The Department Head gives signature authority on all graduate forms to the ME Graduate Program Chair (i.e., Associate Department Head for Graduate Studies).*** The ME Graduate Coordinators have access to the ME Graduate Chair's signature stamp.

The following ME departmental forms are downloadable:

[Independent Study for Mechanical Engineering](#)

[Mechanical Engineering Plan of Study](#)

[Nuclear Engineering Plan of Study](#)

SACS Accreditation Forms:

[MENG SACS Form](#)

[MS SACS Form](#)

[PhD SACS Form](#)

Additional Academic forms available upon request:

[Comprehensive Fee Waiver Form](#)

Grade Change Request Form

Download selected forms from the [Graduate School's](#) web site:

Admissions

[Additional Required Information](#) (All Applicants)

[Application Fee Waiver](#)

[Application for Readmission](#)

[Application for Simultaneous Degree](#)

[In-state Tuition Request](#)

[International Application](#)

Mechanical Engineering Graduate Program

[Payment Processing Form](#)

[US & Permanent Resident Application](#)

Enrollment

[Academic Relief, Cook Counseling Center](#) (Withdraw for medical reasons)

[Academic Relief, Schiffert Health Center](#) (Withdraw for medical reasons)

[Application for Certificate](#)

[Change of Campus](#)

[Change of Graduate Program](#)

[Change of Degree Status](#)

[Start of Semester Defense Exception Request](#) (Formerly known as DSS)

[Graduate Course Withdrawal](#) (WG) (Use this form if you are only dropping one class, but are still enrolled in other classes)

[In Absentia Status Request](#)

[Leave of Absence Request](#)

[Name Change Request](#)

[Student Resignation/Withdrawal Form](#) off-site link (Use this form if you are dropping all classes)

Academic Progress

[Accelerated Undergraduate/Graduate Degree and Course Designation](#)

[Change of Committee-Advisor](#)

[Course Justification Request](#)

[Graduate Committee Service Approval](#)

[Plan of Study Change](#)

[Request to Admit Candidate to Final Exam](#)

[Request to Admit Candidate to Final Exam](#) (Non Thesis, EdS)

[Request to Admit Candidate to Preliminary Exam](#)

[VT Employee-Student conflict of interest agreement](#)

[VT Employee-student conflict of interest agreement](#) (Word Doc)

[Thesis Option Change Request](#)

Graduation

[Degree or Certificate Conferral Request](#)

[Diploma Replacement Request](#)

[Thesis Dissertation Approval](#)

[ETD LaTeX Template](#)

[ETD Word Template](#)

[ETD Title page and abstract Word template](#)

[International Invitation for Commencement Request](#) (via HokieSPA Student Degree Menu)

[Letter of Completion Request](#) (via HokieSPA Student Degree Menu)

[Survey of Earned Doctorates](#)

Specific Guidelines related to Covid-19

Labs must adhere to policies including use of appropriate PPE & physical distancing.

All faculty, staff, and students must complete EH&S Coronavirus awareness online module.

General Research FAQs: <https://www.research.vt.edu/covid-19-updates-impacts/faqs/general-research.html>

OVPRI Phase 3 Guidance: <https://www.research.vt.edu/covid-19-updates-impacts/phase-three-reopening.html>

Graduate student FAQs: <https://graduateschool.vt.edu/fall2020-plan/covid-faqs.html>

DC area FAQs: <https://ready.vt.edu/faq/dc-area.html>