



COLLEGE OF ENGINEERING
CHEMICAL ENGINEERING
VIRGINIA TECH™

Graduate Student Policies and Procedures Manual 2019-2020

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CHEMICAL ENGINEERING DEPARTMENT AND GRADUATE SCHOOL

POLICIES AND PROCEDURES MANUAL

REQUIREMENTS FOR A GRADUATE DEGREE

COURSE REQUIREMENTS

Departmental Core Graduate Courses

The following five courses or equivalent are required by all those studying for an advanced degree in chemical engineering:

ChE 5044	Engineering Mathematics	Fall
ChE 5094	Advanced Chemical Engineering Kinetics	Fall
ChE 5125	Transport Phenomena I	Fall
ChE 5126	Transport Phenomena II	Spring
ChE 5144	Advanced Thermodynamics	Fall

Department of Chemical Engineering Elective Courses

ChE 5034	Introduction to Polymer Materials
ChE 5214	Polymeric Biomaterials
ChE 5304G	Advanced Biological Transport Phenomena
ChE 5334G	Colloid & Interface Science
ChE 5544G	Advanced Protein Separation Engineering
ChE 5564	Non-Newtonian Fluid Mechanics

Not all electives are offered each year.

Registration

Students register electronically using HOKIE SPA which is accessed by using their PID (personal identifier). New students can register beginning about 2 weeks before the semester starts during the published registration dates set by the Registrar's Office. The Timetable of Classes and the dates and deadlines can be found on the HOKIE SPA website. Continuing students are given an eight-day period in the middle of each semester to register electronically for classes for the next semester. Students may adjust their schedules using the DROP/ADD feature during the scheduled time

periods. The Add period ends after the first week of classes and the Drop period lasts for a larger part of the semester.

Students must be registered for at least 12 credit hours each semester (Fall and Spring). Graduate students do not need to enroll for classes in the summer, unless they are planning to complete an exam (preliminary or final). Students would need to be registered for at least 3 credit hours if they are planning to do their preliminary exam in the summer and for the one hour SSDE (Start of Semester Defense Exception) if they are doing their final exam. More information about exams can be found later on in this manual.

Note that since research credits are variable, the amount of hours taken will need to be entered for those courses. Research hours should not be taken until a research advisor has been assigned. Also, the departmental seminar course, ChE 5944, is a required class for all graduate students each semester.

Academic Eligibility

All candidates for graduate degrees must maintain a 3.0 "B" grade point average (GPA) overall and on the plan of study. In addition, the Department of Chemical Engineering requires that each student maintain a "B" average for all courses numbered 5000 and above. Failure to maintain this average in graduate study requires that you be placed on departmental probation. Enrollment for one semester of probation is usually permitted to remedy an unsatisfactory GPA. If a student fails to make satisfactory progress toward the degree, permission may be denied to continue the program. This decision may be reached by the advisory committee or the department head and recommended to the Graduate School.

Temporary Advisors

New graduate students will be assigned a temporary advisor for the first semester or until a research advisor is chosen. Students should talk with their temporary advisor when making decisions concerning registration. Students on assistantships will register for the core courses plus the seminar course and any additional elective courses to equal at least 12 credit hours each semester. Once they start doing research, they can register for Research and Thesis (MS) or Research and Dissertation (PhD) hours.

PLAN OF STUDY

The Plan of Study is your schedule of research and coursework to complete your degree. The plan should be submitted to the department to be entered and sent electronically to the Graduate School for approval according to the following schedule:

MS & MEng: Due by end of the second academic semester.

PhD: Due by end of the third academic semester.

A blank form to use for submitting the plan of study is available from the ChE Department website at www.che.vt.edu. (See Appendix for sample forms). You must complete the form and have it signed by the members of your research advisory committee. The completed form is submitted to the Departmental Graduate Program Coordinator for further processing electronically. The Department Head and then the Graduate School approve the plan and the student will receive a pdf copy for his/her records. Another copy is placed in the student's file. Students may also access their approved plan of study via HOKIE SPA. The plan must contain the 14 credits of core courses in transport phenomena, thermodynamics, kinetics and mathematics, as well as the additional required credits for the specific degree.

Changes that may occur relative to this plan should be immediately filed with the Departmental Graduate Program Coordinator so that at the time of graduation, there will be no question by the Graduate School as to what the student's program has been and if it meets the requirements for graduation. Once a course included on the Plan of Study is taken for a grade, it cannot be eliminated from the Plan of Study. The form necessary to make these changes may be obtained from the Graduate School website.

Your Plan of Study is usually completed with the help of your advisor and committee members. You must obtain at the minimum a 3.00 GPA on all courses listed on the Plan of Study, including prerequisite and supporting courses.

A maximum of three credit-hours of seminar for MS and MEng degrees and four credit-hours for PhD may be included on the plan of study. Courses numbered below 4000 are not counted toward the minimum credits required for the MS, MEng or PhD degree. For clarification on any point, you are encouraged to consult the Graduate Catalog on the Graduate School's website (www.graduateschool.vt.edu).

Requirements for a Master of Engineering (MEng) Degree (Project & Report)

Minimum total credits = 30

- minimum of 24 graded credit hours which may include:
 - maximum of 9 credits total of 5974, 5984 and 6984 courses
 - maximum of 6 credits of 4000 level undergraduate coursework
 - maximum of 3 credits of 5944 (seminar)
 - all other coursework must be 5000 level or higher
- minimum of 3 credits of 5904 (Project and Report) and a maximum of 6 credits (Note: Project and Report cannot be used on PhD plan of study)

The requirements for a MEng degree are basically the same as for a MS degree except for the minimum and maximum number of credit hours. A MEng student must take a minimum of 24 graded credit hours. He/she must register for a minimum of three and a maximum of six credit hours of ChE 5904, Project and Report. The student must have a final oral examination and turn in a final project report to his/her advisory committee. This document does not have to be turned in to the Graduate School. The student must

be registered for ChE 5904, Project and Report before and/or during the semester he/she takes the final examination and completes his/her degree requirements. The composition of the report will be at the discretion of the student's advisory committee. The guidelines for the plan of study should be the same as for a MS degree other than the minimum and maximum credit hours. A minimum of 30 total credit hours is required. Note: ChE 5904, Project and Report, cannot be used on plan of study for PhD.

Requirements for a Master of Engineering (MEng) Degree (Non-Thesis)

(optional additional degree for direct-PhD students)

Minimum total credits = 30

- minimum of 30 graded credit hours which may include:
 - maximum of 9 credits total of 5974, 5984 and 6984 courses*
 - maximum of 6 credits of 4000 level undergraduate coursework
 - maximum of 3 credits of 5944 (seminar)
 - all other coursework must be 5000 level or higher

*Independent Study (5974) course during the student's first three semesters can be used to fulfill the course requirements for the MEng, if needed. Student's advisor would be instructor for the Independent Study. The Independent Study form would need to be submitted to the Graduate Program Coordinator two weeks before the semester in which the Independent Study would take place.

MEng degree would be awarded during the semester that the student completes their preliminary exam, as long as all courses listed on the MEng plan of study have been completed.

Requirements for a Master of Science (MS) Degree

Minimum total credits = 30

- minimum of 20 graded credit hours which may include:
 - maximum of 6 credits total of 5974, 5984 and 6984 courses
 - maximum of 6 credits of 4000 level undergraduate coursework
 - maximum of 3 credits of 5944 (seminar)
 - all other coursework must be 5000 level or higher
- minimum of 6 credits of 5994 (Research and Thesis)

Fourteen hours of 5000 level and higher courses will be the major core courses in chemical engineering (ChE 5094--Kinetics; 5125--Transport I; 5126--Transport II, 5144--Thermodynamics and 5044--Engineering Mathematics). The remainder of the plan of study may concentrate in fundamental areas of study such as transport phenomena, reaction kinetics, or polymers. The student may pursue fundamental study in topics related to the application of fundamentals such as polymer engineering, biochemical engineering or natural resource utilization. You will be encouraged to

recognize the interdisciplinary nature of chemical engineering study and may choose background courses from chemistry, physics, mathematics, the life sciences, or other engineering fields.

Requirements for a Doctor of Philosophy (PhD) Degree

Minimum total credits = 90*

- minimum of 27 graded credit hours at the 5000 level or higher which may include:
 - maximum of 18 credits total of 5974, 5984 and 6984 courses
 - maximum of 4 credits of 5944 (seminar)
- maximum of 6 credits of graded 4000 level undergraduate coursework
- minimum of 30 credits of 7994 (Research and Dissertation)

**A maximum of 50 percent of the graded credit hours may be in the form of approved transfer credits.*

Other important requirements for the PhD degree are the successful passing of the PhD qualifying examination, as well as the successful completion of a preliminary examination and passing of a final defense (oral exam) related to the student's research project. The details of these requirements are described in subsequent sections.

In addition to a PhD degree, students will also be awarded a Master of Engineering degree upon completion of their preliminary exam. This requires an extra 3 credit hours of coursework and the paperwork described in the checklist for PhD students. The only exception to this is that students with MS degrees in chemical engineering from Virginia Tech or another U.S. university will not need to complete the requirements for a MEng degree.

SEMINAR REQUIREMENTS

Attendance at all departmental seminars is required of all Chemical Engineering graduate students. A list of the seminars will be circulated at the beginning of the semester. Additionally, all graduate students must register for ChE 5944, Graduate Seminar, each semester. Any absences from the departmental seminars must be approved by the faculty in charge in advance. All PhD students must present a seminar before completion of their requirements for graduation. The student should see the faculty member in charge of the seminars to schedule their presentation.

ETHICS AND INTEGRITY REQUIREMENT

All entering ChE graduate students are required to complete the following to satisfy the Ethics and Integrity Requirement.

1. *Attend a department orientation prior to the beginning of the fall or spring semester.*

Attendance is taken at this orientation and will be recorded in each student's departmental record. At this orientation the ChE Ethics and Integrity Requirements will be presented, and students will be informed of the timeline for satisfying these requirements.

2. *Complete CHE-5944, Graduate Seminar.* During the fall semester, a lecture will be presented on the nature of plagiarism, how to avoid plagiarism, the Virginia Tech Honor System, Intellectual Property, and discussion of the ACS "Chemical Professional's Code of Conduct" and the AIChE "Code of Ethics". Attendance at this seminar will be recorded in the student's departmental record.

3. *Complete the NSF Responsible Conduct of Research (RCR) requirement as implemented at Virginia Tech.* Completing the on-line course created and maintained by the Collaborative Institutional Training Initiative (CITI) satisfies this requirement. On completion of this course, students are awarded a certificate of completion. This certification must be submitted to the ChE Graduate Coordinator within the first month of graduate enrollment, and will be recorded in the student's departmental record. The website for the on-line course is: <http://www.research.vt.edu/research-integrity-office/responsible-conduct-research/nsf.html>

Students will record completion of this requirement on their plan of study when it is submitted for departmental and Graduate School approval.

INCLUSION AND DIVERSITY EDUCATION REQUIREMENT

Beginning in Fall 2019, the Graduate School requires that all graduate students take an Inclusion and Diversity Education course. Our department will satisfy this requirement by asking our graduate students to enroll in the course offered by the Engineering Education department: ENGE 5984: Graduate Student Success in Multicultural Environments. The course will cover topics such as: 1) facilitating clear communication with advisors, peers, or undergraduate mentees; 2) receiving and responding to critical feedback; 3) upholding ethical research practices; and 4) working within a culturally diverse environment. This course will be graded as a Pass/Fail class and should be included on a student's plan of study.

THESIS TOPIC SELECTION

Students will be issued a document during the Fall Semester that will contain short descriptions of research topics from each faculty member within the Department. Soon thereafter faculty presentations will be scheduled by the Graduate Coordinator. Each graduate student who is selecting a topic must attend these scheduled presentations, which are usually held before the end of the Fall Semester. Following these presentations, two to three weeks are given for the student to further discuss any specific topics with the individual faculty member. Next, a list of the student's choices of advisors is submitted to the departmental Graduate Program Coordinator. This list of

choices should include at least three different professors such that when the Department Head (in conjunction with the faculty) looks over the student's choices, a degree of flexibility will exist regarding the assignment of research advisors. Based on several factors such as research support of the given advisor and the size of their particular research group, assignments are made. Whenever possible, the faculty will try to match the student with their first choice of research project. It should be emphasized that this match is not always possible.

GRADUATE RESEARCH ADVISORY COMMITTEE

The graduate research advisory committee for Masters candidates should consist of at least three faculty members. These include the research advisor (who will act as chairman of the advisory committee), a second member of the chemical engineering faculty, and a third member of the committee who may be chosen from the chemical engineering faculty or one of the other faculty at this University. Additional members of the research advisory committee may be chosen at the discretion of the research advisor and the student.

If a student is planning to use a non-Virginia Tech faculty member on their advisory committee, that person will need to be approved by the Graduate Dean. There is a form (see Appendix) that will need to be completed and sent to the Graduate School along with a current copy of the person's vita. Once the person has been approved by the Graduate School, they will be issued an ID # so they may be added to the plan of study.

The research advisory committee for PhD candidates should consist of at least four faculty members. These include the research advisor and three additional members including at least two from the Department of Chemical Engineering.

The research advisory committee is responsible for approving the plan of study, evaluation and approval of the research proposal and should be available for consultation and advice during the entire duration of the research project.

ANNUAL GRADUATE STUDENT EVALUATION REPORT

The student's advisor and/or committee are required to conduct a yearly review of a student's academic progress. The Annual Graduate Student Evaluation Form is located on the Chemical Engineering website. The self-evaluation portion of the form should be completed by the student, then given to their advisor for his/her comments. The student and advisor should set up a meeting to discuss the complete evaluation, sign and then return the form to the Graduate Program Coordinator by the specified deadline. These forms should be done during Spring semester of each year.

QUALIFYING EXAMINATION FOR PHD CANDIDATES

In order to qualify as a PhD candidate within the Department of Chemical Engineering, the student must pass the qualifying examination, which will be a research-based oral exam given in the week immediately preceding the first week of

classes in the Fall semester. An exam committee of at least three members of the Chemical Engineering Faculty will conduct the exam. The exam committee will recommend a result to the Graduate Committee based on (a) the student's grades in graduate school; (b) the advisor's comments and (c) the student's abilities demonstrated in an oral exam. The exam will be preceded by a discussion of (a) and (b) by the exam committee, and preparation of a 20-30 minute research talk and an abstract by the candidate.

The exam

Topic: The student should prepare a proposal for a research project into a new area of engineering or science. The topic should be decided in conjunction with the student's research advisor. The intention of the exercise is that the student will be designing the research that the student will do for their Ph.D. research, and presenting it to faculty, some of whom may later be on their thesis committee. The student is not obliged to continue research on the topic of their Qualifier exam. If the student and advisor prefer, the student may concentrate their efforts on describing the first year of the proposed research.

Abstract: The student should prepare an abstract for their talk, and submit it electronically to the Graduate Program Coordinator no later than 3 days before their Qualifier exam. The style of the abstract should be similar to the Intellectual Merit section¹ of the Project Summary² given in an NSF proposal, and the length should not exceed one page.

Oral Exam: The task is to propose a topic and a course of research to improve understanding of that topic. The following subsections may be useful when preparing the talk: (1) the hypothesis. It is useful for the student to prepare a one sentence hypothesis or "thesis statement" in addition to more detailed objectives described in (6); (2) the application or scientific interest that makes the topic worthy of study; (3) background literature and theory (4) outline of methods to be used; (5) preliminary estimates of the magnitude of effects or resolution of experiments; (6) plan or timeline; and (7) rationale: how will your results test your hypothesis? During the exam, the committee will ask questions on the research topic and may ask questions on any area of chemical engineering, particularly those in which course grades suggest deficiencies. All members of the thesis committee are welcome to attend. Preliminary results are not required but may be included.

Possible grades for the exam are: Pass, Conditional Pass, Fail, Discontinuing Fail.

¹ **Intellectual Merit:** How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

² **NSF Project Summary:** The proposal must contain a summary of the proposed activity suitable for publication, not more than one page in length. It should not be an abstract of the proposal, but rather a self-contained description of the activity that would result if the proposal were funded. The summary should be written in the third person and include a statement of objectives and methods to be employed. It must clearly address the intellectual merit of the proposed activity. It should be informative to other persons working in the same or related fields and, insofar as possible, understandable to a scientifically or technically literate lay reader.

Fail: Student has the opportunity to retake the exam.
Discontinuing Fail: The student is no longer in the Ph.D. Program

Timing: the exam will take place in the week immediately prior to the Fall semester, in a set of blocks arranged by research areas.

PRELIMINARY EXAMINATION: PHD CANDIDATES

The preliminary examination is required of all doctoral students. The proposal and its preparation, discussion and utility, are determined by the student's PhD advisory committee. An oral examination of the PhD candidate's research proposal will be conducted by the student's advisory committee shortly after the submission of the written proposal. The preliminary exam must occur within the first three years after enrollment in the PhD program. To avoid tuition charges in the summer, preliminary exams should be conducted during Fall and Spring semesters. Preliminary exams should not be scheduled any later than the first two weeks at the beginning of the Fall or Spring semester following the three-year time limit.

The student should schedule their preliminary exam by using the Electronic Signature Approval System on the Graduate School's website. The student's advisory committee will automatically receive an e-mail from the Graduate School asking them to approve the schedule for the exam. The examination must be scheduled between the first day of class and the last day of final examinations in an academic semester. After the exam, the advisory committee will approve or disapprove the exam using the Electronic Signature System.

One negative vote is permitted on the preliminary examination. If performance on the preliminary examination is unsatisfactory, one full semester must lapse before the administration of a second examination. The preliminary exam may only be attempted twice.

PROCEDURES FOR THE DEFENSE OF A GRADUATE THESIS/DISSERTATION

A final oral examination is required of each candidate for the MS and PhD degrees. The student must be registered during the semester he/she takes the final examination and completes his/her degree requirements. If registration is for defense only, the minimum registration is for 3 credit-hours, unless the student is on an assistantship. Students on assistantship or fellowship must be registered for a minimum of 12 credit hours as specified in the Graduate Catalog. If a student is not on an assistantship and will be defending within the first 5 weeks of the semester, they may be eligible for defending student status and may be registered for one hour by the Graduate School (see Defense Only Registration below).

Timeline for Final Defense and Thesis Submission

1. **Reserve a time and location for the defense.** This should be done early, preferably at least one month before the final defense because it can be difficult to find a date and time when all committee members are available. We recommend

that as soon as the advisor and student have established a complete first draft of the thesis, that they meet to estimate a time at which the thesis can be ready.

2. **Schedule the Exam.** This is the term used by the university for officially setting the exam time. Scheduling is done using the Electronic Signature Approval System on the Graduate School's website. The student's advisory committee will automatically receive an e-mail from the Graduate School asking them to approve the schedule for the exam. There are university wide rules set by the graduate school for this procedure and those rules supersede advice given in this manual. Scheduling of the Exam must be done at least two weeks before the exam. At this point the committee chair agrees that the thesis is ready for submission, and the student agrees to submit the thesis to the committee two weeks prior to the Oral Exam so that the committee has sufficient time to read the thesis.
3. **The Oral Exam.** In a typical Oral Exam, the student presents a seminar that would be about one hour if uninterrupted. The committee may ask questions during the presentation or afterward. This portion of the exam is open to the public and so friends, family and Department members may attend. The open portion is followed by a closed portion of the exam, where only the committee and student are present, and the committee may ask further questions. The committee usually meets immediately following the closed portion and reaches a decision on pass or fail. This decision is recorded formally online but is usually communicated to the student immediately.
4. **Approval of Thesis.** The committee reads the thesis in the two weeks prior to the exam. After reading the thesis, the examination committee often requires or suggests revisions. After making revisions, the student should present a final version to the committee before electronic submission to the graduate school. The final version is approved or otherwise by the committee online.

Administrative Aspects of the Exams

The student must be able to complete all other degree requirements within the semester when the examination is held: all coursework on the Plan of Study will need to be completed with grades of C- or higher and both the Plan of Study GPA and the overall GPA must be a 3.0 or higher by the end of the semester. Because some of the problem situations with deficient grades or credits require retaking courses or adding credits, the Plan of Study should be examined at the beginning of the semester in which a student plans to take the Final Examination.

The examination must be scheduled between the first day of class and the last day of final examinations in an academic semester. Students graduating in the Spring will be required to submit the completed and corrected thesis/dissertation to the Graduate School at least ten full days (excluding Saturdays and Sundays) before the day on which commencement exercises are held. Deadlines are posted on the Graduate School website. After the exam, the advisory committee will use the Electronic Signature System to approve the oral exam as well as approve the ETD once it has been submitted.

Plagiarism and Copyright issues with Exams

The thesis and oral defense present original research performed by the candidate. The candidate should always clearly communicate to the committee their own contributions. The Department recommends that every thesis contain the following elements:

1. A statement of the contributions by the candidate or a list of contributions from others. This can either be given at the beginning of the thesis or on a chapter by chapter basis.
2. Statements about the copyright status. For any figure that is copied directly, the candidate should include a statement in the caption such as: Figure X reproduced from (full citation including authors, journal etc) with permission. Permission for reproduction of figures in thesis of a paper author is often automatic for journals, but it is responsibility of the candidate to check whether this is so for the particular journal and if not, to obtain permission.

For example, if a complete published paper is included as a chapter in the thesis, the department recommends that the chapter begin with a statement such as

This chapter was published in [full citation of the published paper]. The following contributions were made by other authors (e.g. the data in Fig X was obtained by person Y, or all the X-ray crystallography and interpretation was done by Z). The paper has been reproduced with permission from the Journal.

The Department recognizes that when a manuscript is prepared for journal publication, many people may have contributed to the writing. This is a difficult area for students to clearly delineate their contribution to writing. The department recommends that the candidate make a statement along the lines of: “The following people contributed to the writing of the paper:..”

In the introduction to the thesis, an individual figure is sometimes copied from another source. The caption to the figure should state that the “figure has been reproduced with permission from [full citation]”. It is not sufficient to simply write a number that links to the bibliography. The latter is the method for attribution of an idea or a result, not for copying or quoting something directly.

iThenticate

Graduate students are required to verify that their ETDs (electronic thesis and dissertations) are appropriately written and cited. The Graduate School provides a resource and tool known as iThenticate to review their written materials (e.g., papers, article drafts, drafts of thesis/dissertations, etc.). Before a student can schedule their final exam, they must run their ETD through iThenticate and the similarity report must be reviewed by the student and their advisor prior to scheduling the final exam. The final similarity report must be included in the submission of the ETD to the Graduate School. Instructions for using iThenticate can be found on the Graduate School’s website.

Any portion of the thesis that is excluded from the iThenticate review should be clearly indicated in the thesis, for example by a statement at the beginning of a chapter that the chapter is reproduced from a published paper.

Format of Thesis

A thesis usually consists of the following sections:

- Abstract
- Introduction
- Materials and Methods
- Chapters of Results
- Overall Conclusions
- Future Work

It is often useful to consult prior theses from the same research group or within the Department.

It is permissible to write a thesis based on manuscripts. In this case, the student is still expected to write overall Abstract, Introduction, Conclusions and Future Work sections. The remaining chapters are simply reproductions of published or submitted works. Students sometimes find that a paper-based thesis is much faster to prepare than a traditional thesis, and they should consult their advisor at an early stage to determine whether this is suitable. Details can be found at:

<https://guides.lib.vt.edu/c.php?g=547528&p=3756998>

DEFENSE ONLY REGISTRATION

Start of Semester Defense Exception (SSDE) is a special enrollment category for students who have fulfilled all requirements, *including advisory committee review and agreement that the thesis or dissertation is ready for defense*, and are registering only to take the final oral examination. The defense must be scheduled during the first five weeks of the semester.

To qualify for start of semester defense exception, a student must have:

- completed all requirements (including passing grades on all courses on the plan of study), except for the final exam **and**
- submitted the final copy of the thesis/dissertation to the advisory committee **within the first three weeks of the semester and at least two weeks before the defense and**
- received permission from the advisory committee, **who have read the document and consider it ready for defense** (to the extent that the student can make corrections and submit the ETD within two weeks of the defense) within the first three weeks of the semester **and**
- been enrolled in at least three credit hours the preceding semester **and** submitted the SSDE form to the Graduate School **by the Friday of the third week of classes or no later than three weeks prior to the defense**, whichever date comes first

Scheduling a Final Exam within the Start of Semester Defense Exception Timeline

To defend under SSDE, a student must schedule and attend the defense according to the following timeline:

Within the **first three weeks** of the semester:

1. Submit SSDE form to the Graduate School
2. Wait for the Graduate School to enroll student in 1 cr (students cannot enroll themselves)
3. Submit Application for Degree in HokieSPA
4. Submit Request for Final Examination (at least two weeks prior to the exam date) in the Electronic Signature System

International students who qualify for SSDE must defend (complete final exam) within the first 5 weeks of the semester to maintain immigration status.

Students may be on SSDE status anytime during the Summer and still be on an assistantship. The SSDE form should be submitted at the beginning of the session in which the student plans to defend their thesis/dissertation.

APPLICATION FOR DEGREE

Students should complete an Application for Degree during the semester they plan to complete their degree requirements. Applications can be submitted on line through HOKIE SPA. The deadlines for submission of the Application for Degree are as follows:

Completing Degree Requirements in:	Apply on or before:
June	June 1 st
August	August 1 st
December	October 1 st
May	March 1 st

SUBMISSION OF THESIS/DISSERTATION

All graduate students are required to submit their thesis/dissertation electronically. Electronic theses and dissertations will be forwarded to the library and made available on the World Wide Web. Documents will be fully word searchable and will therefore become much more accessible to scholars. To obtain more information about electronic thesis/dissertation, you may access the website at <https://guides.lib.vt.edu/ETDguide>. The Graduate School conducts periodic workshops for instructions on using the electronic thesis/dissertation software. Keep an eye out for the announcements.

If a student cannot meet the two-week requirement after the defense to turn in their electronic thesis/dissertation, their advisor must send an e-mail request to the Graduate School asking for an extension. If an extension is not asked for and the student does not turn the ETD in within two weeks, the application for degree for that semester will be terminated and the student will have to enroll for the next semester.

The Department does not require a hard copy of the thesis/dissertation because of limited storage space, however, the graduate advisor may request a hard copy for his

or her use.

FINANCIAL SUPPORT

The Department will make every effort to supply financial aid to qualified MS and PhD students. This aid may take the form of internally-funded or externally-funded fellowships and scholarships, support as a graduate research assistant on sponsored research projects, or as a teaching assistant supported by state and/or departmental resources.

Graduate students of "regular" status may be offered graduate assistantships. Stipends are determined by student's qualifications (i.e., academic achievement and experience) and the work required of the student. Exact stipends are determined annually based on the departmental review of the student's prior qualifications and academic/research performance according to different stipend levels set by the Graduate School.

An assistantship constitutes a 20-hour per week commitment. Students on an assistantship must be enrolled for 12 credit hours per semester. There are two types of assistantships available: the Graduate Teaching Assistant/Graduate Assistant (GTA/GA) position and Graduate Research Assistant (GRA) position. These are explained in further detail below.

Graduate Teaching Assistantships

Typical duties of a teaching assistant are (1) to grade homework assignments, quizzes and tests; (2) to hold regular office hours for the purpose of helping students with problems; and (3) to conduct problem sessions in class. At the discretion of the individual professor, actual duties may include all or some of those listed above. Students appointed to GTA positions must demonstrate a high degree of communication skills. It is the responsibility of the student to understand the specific duties required by the professor in charge of the course. GTAs are funded by departmental monies which are allocated to teaching. It is taxable income for the student.

Graduate Research Assistantships

GRA support money comes from sponsored research programs by professors in the Chemical Engineering Department. The funding level of GRA positions is totally at the discretion of the professor directing the research project, therefore, any questions concerning GRA support should be addressed to your major professor. GRA support is taxable income for the student.

College of Engineering Funding

Pratt Graduate Fellowships

Eligibility: Academically outstanding students. No restriction on

national origin or immigration status.
Stipend: Add-on stipends considered research scholarships can be offered to either GTAs or GRAs

Davenport Fellowships

Eligibility: Academically outstanding students. Must be U.S. citizen
Stipend: Add-on stipend, amount may vary. Offered to either GTAs or GRAs

Walts Fellowships

Eligibility: Academically outstanding students. Must be U.S. citizen
Stipend: Add-on stipend, amount may vary. Offered to either GTAs or GRAs.

Additional Department Funding

The Mike and Lisa Kender Graduate Fellowship

Eligibility: PhD student, first-year and continuing students
Stipend: Full or partial fellowships, amount may vary. Recipients to be determined by Department Head.

Steven Reese Graduate Assistantship

Eligibility: Graduate student providing teaching or research support to faculty within the department
Stipend: Add-on stipend, amount may vary. Recipients to be determined by Department Head.

Robert Hord Fellowships

Eligibility: PhD student, first-year and continuing students
Stipend: Full or partial fellowships, amount may vary. Recipients to be determined by Department Head.

Moreen E. & Edward P. Kinney, Jr. Scholarship

Eligibility: First-year and continuing graduate students, US citizens or permanent residents.
Stipend: Add-on stipend, amount may vary for GTAs or GRAs. Preference requested by donor: students receiving undergraduate degrees from Canada or West Virginia. Recipients to be determined by Department Head.

Robert C. and Catherine E. Luckner Fellowships

- Eligibility: First-year and continuing graduate students, U.S. Citizen or permanent residents.
- Stipend: Add-on stipend, amount may vary.
Recipients to be determined by Department Head.

Martin R. Tant Graduate Fellowship

- Eligibility: First-year and continuing graduate students. Preference given to students working in the polymer science or biomedical engineering area.
- Stipend: Add-on stipend, amount may vary.
Recipients to be determined by Department Head.

Graduate School Funding

Cunningham Doctoral Assistantships

- Eligibility: U.S. citizen entering first year of graduate study as a PhD candidate with outstanding academic record and strong potential for completing a PhD degree
- Stipend: Assistantship stipend as either a GTA or GRA plus in-state tuition scholarship - amount determined by department
- Duration: Up to two years with matching funds from department
- Nominated by respective department and selections made by the Graduate School Dean

Dean's Diversity Assistantships

- Eligibility: U.S. citizens or permanent residents entering first year of graduate study
- Stipend: Assistantship stipend plus in-state tuition scholarship
- Duration: One year followed by a minimum of one additional year of funding from department.
- Apply to Graduate School

David W. Francis and Lillian Francis Scholarship Fund

- Eligibility: PhD student doing research emphasizing longer, safer and healthier lives in agriculture, engineering, bioinformatics, plant pathology, wood science and forest products, veterinary medicine and biotechnology. Students must be in their final year of research.
- Stipend: \$22,500 plus tuition
- Duration: One academic year.
- Students are nominated by respective department and

selections are made by the Graduate School Dean.

James F. Powell Fellowship

Eligibility: Restricted to long-term Virginia residents with financial need. MS and PhD students entering their first year of graduate study.

Stipend: \$20,000 stipend plus in-state tuition.

Duration: One academic year.

- One nomination per department.

GEM Fellowships (Masters)

Eligibility: Underrepresented minorities in engineering.

Stipend: Stipend of up to \$16,000 over 3 semesters. Full tuition and fees for four semesters.

Requirement: Two 12-week summer internships with sponsoring GEM Member Company

- Apply to GEM

GEM Fellowships (PhD)

Eligibility: Underrepresented minorities in engineering

Stipend: Minimum of \$14,000 academic year stipend for up to the 5th year. Full tuition and fees paid by the university

Requirements: 12-week summer internship with sponsoring GEM Member Company. Fellow must accept a research or teaching assistantship after the first year

- Apply to GEM

Other Scholarships and Fellowships Available from Outside Resources:

These require the student to make application to the agency supporting the fellowship. Applications may be obtained from the Sponsored Programs Office. Specific deadlines may apply to these programs. These cannot be reported here as they change each year. More extensive description of these awards is available on the Research and Graduate Studies website.

NSF Graduate Fellowships

Eligibility: Students with special aptitude for advanced training in science and engineering; U.S. citizens or permanent residents

Stipend: \$32,000 for 12-month awards (prorated monthly at \$2,666.66 for lesser periods). Tuition & fees paid for Fall and Spring semesters.

Duration: Awards are for 3 years of financial support, tenable over a 5-year period
• Apply to National Science Foundation

STUDENT ACCOUNT INFORMATION

Electronic Bills

Student's account statements are available on-line for viewing and payment through an electronic system called QuickPAY. E-mail notifications are sent to Virginia Tech e-mail addresses when a statement has been posted and available for viewing. Students can access their accounts through HOKIE SPA. You may visit the Bursar's website at www.bursar.vt.edu to find out more information.

Late Payment Fee

If your payment is not received by the designated deadline date, you will be dropped from class rolls, will have to late register, and will be assessed a late payment fee of 10% of the past due balance, not to exceed \$125 per term. A reinstatement fee of \$75 is charged if your registration is cancelled due to non-payment of fees. These are two separate fees. Please be sure to pay your fees by the deadline which is located on the timetable of classes website.

Billing Address

The Bursar's Office uses the student's Virginia Tech e-mail address to notify students when their statements have been posted and are available for viewing. It is the student's responsibility to view their bills and be sure the necessary payments are made by the due dates. The student should also make sure their contact information is kept up-to-date on HOKIE SPA.

Budget Tuition Plan

The Budget Tuition Plan allows a student to divide the cost of tuition and fees into monthly installments by using direct debits to his/her bank account. The cost of this service is a non-refundable \$65 application fee. Inquiries about the Budget Tuition Plan should be directed to the Office of the University Bursar. BTP applications may be accessed on their website at www.bursar.vt.edu.

Graduate Comprehensive Fee Payment Plan

Students may enroll in the comprehensive fee payment plan through HOKIE SPA once they are registered for classes. A student must be on an assistantship and their tuition remission entered by the hiring department. The plan is available during Fall and Spring semesters at no cost to the student. A new application is required each semester.

Direct Deposit of Pay

All employees of Virginia Tech are required to have their pay directly deposited to the bank. You may use the on-line enrollment system within HokieSpa or through MyVT - "University Account Information" menu. Students should complete the Direct Deposit for Payroll Distribution as well as the one for all other VT reimbursements (such as refunds, travel reimbursements, etc.).

STUDENT MEDICAL INSURANCE

Virginia Tech offers graduate assistants an enhanced insurance benefit. Assistantship packages will include a medical insurance benefit, covering 88% of the university-sponsored health care premium (for a single student at the \$50,000 coverage level). Students must meet the following criteria: 1) must maintain at least a half-time graduate assistantship; 2) enroll in the university-sponsored health insurance plan; and 3) sign up for the payroll deduction option for payment of premiums. To find out the proper procedures for receiving this benefit and the appropriate forms needed, visit the Student Medical Insurance website by following the link on the Graduate School website (www.graduateschool.vt.edu).

INTERNATIONAL STUDENT INFORMATION

General assistance: International Graduate Student Services
Graduate Life Center
Walk-in Hours: Mon., Wed., Fri., - 1:00 - 5:00 pm
Tu. & Thurs. - 9:00 - 12:00 pm

Legal Status

All international students must hold valid non-immigrant status to enroll at Virginia Tech. No international student will be permitted to register for classes prior to the issuance of a Certificate of Eligibility (I-20AB or IAP-66) and the approval of the Immigration Service to attend the university.

Health Insurance for International Students

All international students must have adequate health and accident insurance. In addition, any spouse and dependent must also have this insurance. The minimum coverage for each international student and their dependents can be found on the Graduate School website.

In order to prevent difficulties in subsequent registration for classes or possible termination of enrollment, it is the responsibility of the student to either purchase the university sponsored insurance plan, or show proof of other insurance meeting the minimum requirements. Students choosing coverage other than the university sponsored plan must present a completed and signed/certified Alternative Insurance Compliance Form to the Student Medical Insurance Office in 110 Student Services

Building. For further information, they can be reached at 231-6226 or e-mail at smi@vt.edu.

Social Security Card Information

All international students must have a Social Security number for employment either on-campus or off-campus. Students may apply for an original Social Security Number (SSN) at a Social Security Administration (SSA) field office by submitting a Form SS-5, Application for a Social Security Card, and providing documentary evidence of age, identity and work-authorized lawful alien status. Documents include: valid passport, Form I-94 (arrival/departure card), I-20 or DS-2019 and proof of employment authorization. The Social Security number is used to record your earnings in this country.

Tax Information

All international students are required to submit Federal and State Income Tax Forms at the end of every year regardless of employment. Forms can be obtained from the Cranwell International Center or Newman Library. There will be a Tax Seminar to help international students in completing tax forms. Please save all receipts from your bank, tuition payments, W-2 statements from your employer, etc. These documents will be needed to complete the forms. Forms must be submitted by April 15 of each year.

Cranwell International Center

The Cranwell International Center is located at 240 West Campus Drive in Harper Hall. The center serves international students, scholars, faculty and spouses from 120 countries and provides a focal point for an extensive array of educational, cultural and social activities. One of the center's main purposes is to encourage interchange between the international guests and their U.S. colleagues, including members of the local community. National and international student organizations schedule meetings at the center and student leaders are provided with office spaces.

Other services offered by the center include: crisis support and personal assistance, English conversation groups, social events like International Week and the International Street Fair, orientation sessions and cultural adjustment workshops. The main focus of the center is to provide resources and referrals for international spouses and families. More information may be obtained by calling the center at 231-6527 or visiting their website at www.international.vt.edu.

Virginia Tech Language and Culture Institute

The Virginia Tech Language and Culture Institute offers an Intensive English course to international students. Classes include: conversation, pronunciation, composition, listening, vocabulary and grammar on all levels for full- and part-time study. You may stop by the office at 840 University City Blvd., Suite #2, or visit their website at www.lci.vt.edu. Their phone number is 231-9814. E-mail address: lci-info@vt.edu.

DEPARTMENT, GRADUATE SCHOOL AND UNIVERSITY INFORMATION

DEPARTMENT OFFICE IN GENERAL

Copy Machines

A copy machine is available in the Mail/Copy Room (268 Goodwin Hall) for graduate students to use for research related copying. This copy machine is also capable of scanning/sending files to e-mail addresses. Instructions are posted above the machine.

Mailboxes

Mailboxes for graduate students are located in the Graduate Study Room on the third floor (Room 385 Goodwin Hall). These should be checked periodically for important notices and messages. Only business related mail should be sent to the department address.

Packages

Packages are received in the main office and placed in the Mail/Copy Room (268 Goodwin Hall). Students will receive an e-mail if they receive a package and they should be signed for on the log book provided on the table. Packages requiring refrigeration should be picked up as soon as possible after receiving the e-mail.

Keys

Keys will be issued to new graduate students for the rooms where they will have a desk assignment. Keys may be obtained from our Business Manager in Room 253 Goodwin Hall. When a student needs access to a research lab, the faculty advisor will need to send an e-mail to her requesting the keys for the student and indicating which rooms they will need access to. All keys should be returned to her as soon as possible after they are no longer needed. Keys should not be passed along to other students.

Graduate Student Study Room

The Graduate Student Study Room is located in Room 385 Goodwin Hall. This room is used for desk space for entering graduate students and teaching assistants. Keys can be obtained from our Business Manager.

ChEGSA (Chemical Engineering Graduate Student Association)

In the Fall of 2008, the department formally established a graduate student organization (ChEGSA). The purpose of this organization is to promote interactions between graduate students that are separate from their work in the department,

specifically social interactions and to provide a forum for communication between the Chemical Engineering graduate student body and the Chemical Engineering departmental faculty and staff. Another purpose is to organize a graduate student symposium which is usually held in April of each year. The organization holds regular meetings and membership is open to all graduate students enrolled in the department or advised/co-advised by a faculty member in Chemical Engineering. You can check out more information regarding ChEGSA on the department's website. We hope every student will take an active part in the gatherings and social events and help to make their graduate experience more enjoyable.

Safety Training

All faculty, graduate students, postdocs and undergraduate researchers are required to undergo chemical lab safety training once a year. This requirement can be fulfilled either by attending a safety seminar or by taking the online course offered by EHSS (www.ehss.vt.edu). The mandatory safety seminar is usually done in Fall semester, however, if you will be starting work in a lab before the scheduled seminar, you should take the online course. More information about laboratory safety requirements can be found on the department website. Our Lab Safety Coordinator is Dr. Stephen Martin.

Conference Rooms

There are two conference rooms that are available to be reserved for presentations, meetings, defenses, etc. A sign-up calendar (black books) for each room is located in the department reception area in 245 Goodwin Hall in which students may reserve the room. The rooms are: 285 Goodwin Hall with 22 chairs and a capacity of 30 and a smaller room, 289 Goodwin Hall with 10 chairs and a capacity of 17.

MACHINE SHOPS

Departmental

This machine shop is located on the basement floor of Randolph Hall, Room 4-F. Two machinists are available for assistance on research projects. Short and simple job requests are recommended. Drawings and detailed descriptions are desirable and may be required for the machinists. In addition, tools and other parts may be checked out on request. DO NOT remove anything without permission and return items promptly when finished.

Computer and IT Support

The department employs one computer and IT support technician located in 287 Goodwin Hall for assistance with hardware and software resources, interfacing with research instrumentation and troubleshooting data acquisition and control systems among other duties. He is available for consultation regarding computer related projects.

DEPARTMENT PERSONNEL

FACULTY

Luke E. K. Achenie

Professor

B.S. - Massachusetts Institute of Technology; M.S. - Northwestern University;
Ph.D. - Carnegie Mellon University

Donald G. Baird

Alexander F. Giacco Professor

B.S., M.S. - Michigan State Univ.; Ph.D. - Univ. of Wisconsin

Michael J. Bortner

Assistant Professor

B.S. – Penn State Univ.; Ph.D., Virginia Tech

David F. Cox

Professor and Dept. Head

B.S. - Univ. of Tennessee; M.S. & Ph.D. - Univ. of Florida

Richey M. Davis

Professor

B.S. - Clemson Univ.; Ph.D. - Princeton Univ.

Sanket A. Deshmukh

Assistant Professor

B.S. & M.S. - University of Pune
Ph.D. - University College Dublin, Ireland

William Ducker

Professor and Chair of Graduate Program

B.S., Ph.D. - Australian National University

Aaron S. Goldstein

Associate Professor and Asst. Dept. Head for Undergraduate Studies

B.S. - Univ. of California, Berkeley; Ph.D. - Carnegie Mellon Univ.

Ayman Karim

Associate Professor

B.S. – Cairo University; M.S. & Ph.D. – Univ. of New Mexico

Erdogan Kiran

Professor

B.S. - Massachusetts Institute of Technology; M.S. - Cornell Univ.;
Ph.D. - Princeton Univ.

Y. A. Liu

Frank C. Vilbrandt Professor and Alumni Distinguished Professor

B.S. - National Taiwan Univ.; M.S. - Tufts Univ.;

Ph.D. - Princeton Univ.

Chang Lu

Fred W. Bull Professor

B.S. – Peking University; M.S. & Ph.D. – Univ. of Illinois

Stephen M. Martin

Associate Professor

B.S. – Princeton University; Ph.D. – University of Minnesota

Padma Rajagopalan

Robert E. Hord, Jr. Professor

B.S. & M.S. - Indian Institute of Technology, Kharagpur

Ph.D. - Brown University

Rong Tong

Assistant Professor

B.S. – Fudan University; Ph.D. – Univ. of Illinois

Gary K. Whiting

Professor of Practice/Undergraduate Advisor

Joseph H. Collie Professor

B.S. - Lebanon Valley College

M.S. - Virginia Tech (Chemistry) and Ph.D. - Virginia Tech (Chemical Eng.)

Abby Whittington

Associate Professor of Chemical Engineering and

Associate Professor of Materials Science & Engineering

B.S. - Auburn University; Ph.D. - Univ. of Illinois at Urbana-Champaign

Hongliang Xin

Assistant Professor

B.S. – Tianjin Univ.; M.S. – Tsinghua Univ.; Ph.D. – Univ. of Michigan

Huiyuan Zhu

Assistant Professor

B.S. - Univ. of Science & Tech., China (Chemistry);

M.A. & Ph.D. - Brown University (Chemistry)

ADJUNCT, RESEARCH AND VISITING FACULTY**Preston Durrill**

(Professor Emeritus, Chemistry Dept., Radford University)

B.S., M.S. - Massachusetts Institute of Technology; Ph.D. - Virginia Tech

S. Ted Oyama

(Research Faculty)

B.S. - Yale Univ.; M.S., Ph.D. - Stanford Univ.

John Y. Walz

(Adjunct Faculty)

B.S. & M.S. - Tulane University

Ph.D. - Carnegie Mellon University

STAFF

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Undergraduate Program Coordinator

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Lab Instrument Maker

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Bradley Reed

Computer & IT Support Specialist

287 Goodwin Hall, 231-4973

breed17@vt.edu

GRADUATE SCHOOL

Graduate Student Assembly

The Graduate Student Assembly is the University-recognized student governance organization for graduate students at Virginia Tech. The GSA represents the interests, concerns and needs of the graduate student body and is their liaison with the University administration. All graduate students are automatically members of the GSA. The organization is served and governed by a delegate assembly composed of two delegates from each department on campus. The graduate students shall elect two representatives for one-year terms to serve on the Graduate Student Assembly each fall. The GSA has several programs that they are involved with. These include: The Travel Fund Program, Graduate Research Development Project (GRDP), Graduate and Professional School Fair and the Graduate Research Symposium. The GSA also organizes two picnics, one in the fall and another in the spring, as well as other social events during the year. You may find out more information about the programs at the GSA website located under the Graduate Life tab on the Graduate School website.

Graduate Honor System

The Graduate Honor Code demands a firm adherence to a set of values and is founded on the concept of honesty with respect to the intellectual efforts of oneself and others. Compliance with the honor code requires that all graduate students exercise honesty and ethical behavior in all their academic pursuits here at Virginia Tech, whether these undertakings pertain to study, coursework, research, extension or teaching. All graduate students must make it their responsibility to know what is and is not allowed in their academic work. Ignorance is not an excuse. The Constitution of the Graduate Honor System may be found on-line at www.graduateschool.vt.edu under the Current Students tab at the top.

Students should be familiar with the concept of Plagiarism, which is defined by the Graduate Honor System Constitution: "*Plagiarism*: Plagiarism is a specific form of cheating, and is defined as the copying of the language, structure, idea, and/or thoughts of another and claiming or attempting to imply that it is one's own original work. It also includes the omitting of quotation marks when references are copied directly, improper paraphrasing (see Plagiarism), or inadequate referencing of sources. Sources used in preparing assignments for classes, theses, dissertations, manuscripts for publication, and other academic work should be documented in the text and in a reference list, or as directed by the instructor or professor. Sources requiring referencing include, but are not limited to, information received from other persons that would not normally be considered common knowledge (Plagiarism), computer programs designed or written by another person, experimental data collected by someone else, graded permanently-returned materials such as term papers or other out-of-class assignments (koofers), as well as published sources. A more detailed discussion of plagiarism may be found in Plagiarism."

CAMPUS FACILITIES

Newman Library

The Newman Library has over 2 million books, over 30,000 serials/journals, over 15,000 videos, over 6 million microforms, and a computerized inventory that enables users to find most anything in the library. Items may be located using the on-line catalog accessible from the libraries' website at www.lib.vt.edu. There are three branch libraries: Art and Architecture, Veterinary Medicine, and the Northern Virginia Resource Service Center. Computer terminals are located throughout the library and detailed instructions are available adjacent to most terminals or at the Information Desk in the Lobby. Other services are also available on the University Libraries' website.

Computing Center

The Computing Center is the one-stop computing resource site for Virginia Tech. They provide customer support for all computer issues. They provide information concerning activating PIDs, passwords, sign-up for modem pool accounts, wireless access, IP addresses, software and hardware purchasing, and much more. Their website address is www.4help.vt.edu.

Math Emporium

The Math Emporium is a learning center developed by the Department of Mathematics. This facility, located near campus, includes 537 workstations and additional specialized spaces and equipment. The environment provides for a variety of learning methods and offers opportunities for faculty and students to explore better ways to blend technology and personal interaction in their courses. To find out more about the Math Emporium and its services, visit their web site at www.emporium.vt.edu.

Printing Services

Digital Print Center

Digital Print Center is located at 1425 South Main Street. The print center provides convenient and timely reproduction of both black & white and full color original materials with a wide selection of binding and packaging options. Payment can be made either on a cash basis or through a research grant. In the case of the latter, the appropriate form must be obtained from the appropriate administrative assistant in the main office.

Hokie Print

Hokie Print Center is located on the first floor of Squires Student Center and is open Monday through Friday from 8:00 am until 5:00 pm. A print/copy specialist is available to assist customers. Services available are: full-color printing and copying including official university letterhead, resumes and flyers; large format printing of

banners and signs up to 64 inches wide; vinyl print jobs including decals, labels, stickers, pop-up banner stands and A-frame signs. Prices vary depending on size and product. For more information call 540-231-2758.

There are several other private copy centers located in downtown Blacksburg and at University Mall. These should not be used for university related copying unless the Digital Print Center cannot handle the specific job.

University Bookstore

The University Bookstore has two main locations as well as several smaller stores to serve the university. These facilities operate under the name Virginia Tech Services, Inc., a nonprofit corporation which provides support services for the university. The University Bookstore is located on campus next to the library and Graduate Life Center. University Volume Two Bookstore is located off-campus at University Mall near Kroger. Both locations provide a full range of new and used textbooks, course packs and supplemental class materials, as well as a fax service, computer department, office and school supplies, art and engineering supplies and other specialty items. The Clothing and Gifts Department carries a large selection of clothing and souvenir items.

Textbooks are arranged by departments by course numbers. During the first week of classes, any textbook may be returned provided a receipt is presented and the book is in its original condition. After the first week, and through the day after the last day to drop a class, a receipt and a drop slip are required.

Purchases at the bookstore that are related to research may be charged to the department or to a research grant. The bookstore form is obtained from the appropriate administrative assistant in the office. You may also leave material at the Bookstore for binding, including theses and other manuscripts.

Chemistry Stockroom

The chemistry stockroom is on the bottom floor, 171 Davidson Hall. Glassware and chemicals are available here. An inter-departmental form with the appropriate research account number is required. These forms can be completed using the HokieMart ordering system. Instructions can be found at: <https://chem.vt.edu/resources/stockroom.html>.

Fleet Services

The university maintains a fleet of vehicles that may be used for official business such as traveling to a conference. Please see the appropriate administrative assistant to make reservations. Students will need to be registered on the Fleet Services website in order to drive a vehicle.

Schiffert Student Health Center

Schiffert Student Health Center is located in McComas Hall. The health center provides quality health care and health education in support of the university's mission to educate the whole person. SHC has wellness and health services offered by board-certified physicians, nurse practitioners, a physician assistant, health educators and certified college health nurses. The staff also includes pharmacists, medical technologists and radiology technologists. Services are available to all enrolled Virginia Tech students who have paid their health fee. Every student must have a complete health history form on file documenting required immunizations. If not, the student will be blocked from registering for classes. Health care expenses outside of SHC are not covered by the health fee. SHC strongly recommends that you purchase a health insurance policy from a reputable insurance company to cover these expenses.

Center hours are Monday - Friday -- 8 a.m.-5 p.m. and Saturday -- 9 a.m.-noon (appointment only system). Other times are for emergency cases only. Telephone number is 231-6444.

RECREATION AND RELAXATION

Virginia Tech provides an abundant and varied supply of recreational activities, as do all major universities. However, the University's geographic location also produces a myriad of outdoor activities not available at many schools.

McComas Student Health and Fitness Center

The Center includes 3 basketball/volleyball courts, elevated walking/jogging track, 2 fitness studios, weight training and cardiovascular area, 8-lane/25-yard swimming pool, locker and shower facilities and the Recreational Sports Office. You may visit their website at www.recsports.vt.edu. The Schiffert Health Center is also located in McComas Hall.

War Memorial Hall

For use by students, faculty and staff, includes many different sport and recreational activities such as racquetball, basketball, aerobics, swimming, volleyball, gymnastics, handball and more. The gym also houses weight rooms, lockers, showers and saunas.

Virginia Tech Golf Course

9-hole golf course located on the west side of campus. Green fees are \$13.00/\$15.00 for students and golf clubs and carts are available for rent.

Peter Dye River Course of Virginia Tech

The River Course is located at 8400 River Course Drive in Radford, Virginia. The course wraps along 2½ miles of the majestic New River. The course has two

distinct but complimentary nine-hole loops which start and finish adjacent to the club area. Fourteen of the eighteen holes have views to the river. Eight of these play directly to the river's edge. The course also offers a complete practice facility with a driving range, large putting green, chipping green, sand bunkers, a fully stocked Professional Golf Shop and a complete teaching center. Private lessons or group clinics for all ages and playing abilities are available. Student rates are \$30, Monday through Thursday; \$35 on Fridays and \$40 on Saturdays, Sundays and holidays. Contact telephone number is 540-633-6732 or 888-738-3393. Website: www.petedyerivercourse.com.

Tennis Courts

Tennis courts are located at different locations on campus. There are 12 outdoor lighted courts on Washington Street and six on the South Recreational fields that are available to students, faculty and staff.

Intramural Sports Program

Virginia Tech has an extensive intramural sports program in which graduate students may participate. More information may be obtained through the Intramural Sports Hotline at 231-6060 or at www.recsports.vt.edu.

Squires Student Center

Squires Student Center offers many recreational facilities and opportunities to students. Leisure Services located on the first floor behind the Food Court provides 24 billiard tables, 8 bowling lanes, three table tennis tables and a large assortment of video games. Wide screen TV and cd jukebox are available for relaxation in the lounge area. The Venture Out Outdoor Equipment Rental Center is located on the first floor for all your camping, skiing, skating and canoeing needs.

Squires also offers several movie series, coffeehouse and theater events through the Virginia Tech Union. The art gallery on the Second Floor of Squires shows several exhibits during the year. For more information on current happenings, refer to the information desk on the ground floor of Squires.

Passport Acceptance Facility

If you are travelling abroad and need a passport or a renewal, visit the first floor of Squires Student Center. The Passport Acceptance Facility is certified through the US Department of State to help you with your passport needs. You can call to make an appointment at (540) 231-9844 or email SECLPassports@vt.edu. Appointments are ½ hour per application. Visit their link for hours, prices, forms and more information under the Campus Life website: www.campuslife.vt.edu

Moss Arts Center

The Center for the Arts at Virginia Tech and the Institute for Creativity, Arts and

Technology are headquartered in the Moss Arts Center located at 190 Alumni Mall. The 150,000-square-foot facility includes a 1,260-seat performance hall, visual arts galleries, amphitheater, four-story experimental Cube, and multiple studios. The center also offers a multimedia studio, production control room, newsroom, and associated classroom in support of the Department of Communication. A schedule of exhibits and performances can be found on their website at www.artscenter.vt.edu.

G. Burke Johnston Student Center

The G. Burke Johnston Student Center is located between Burruss and Cowgill Halls and in fact, is connected to Burruss by a third-floor bridge. An underground tunnel runs from the first floor to Pamplin Hall. The student center contains three classrooms on the first floor. Student organizations and departments may request to use these classrooms during evenings and weekends through Event Planning, 221 Squires Student Center (231-5005).

Johnston Student Center also contains the following: study lounges on the third floor, Food Court, vending machines, public telephones, automatic teller machines, commuter lockers, Lost & Found and a table checkout service for student groups. Johnston Student Center also has the only revolving door on campus.

War Memorial Chapel

The War Memorial Chapel is located on Drillfield Drive across from the Library. It is a tribute from alumni and friends to those sons of Virginia Tech who made the supreme sacrifice in our nations wars. The space easily accommodates events such as weddings, memorial services, initiations, military commissionings, departmental commencement ceremonies, concerts, religious services and meetings. The doors remain unlocked every day from 6:00 am until 12:00 am.

APPENDIX A

COURSE LISTINGS BY RESEARCH AREA

The following listings give courses which may be helpful to you as you prepare your plan of study.

SUGGESTED COURSES FOR CELL AND TISSUE ENGINEERING AREA

Biochemistry

BCHM 4115	General Biochemistry
BCHM 5124	Biochemistry for the Life Sciences
BCHM 5304	Enzyme Kinetics and Reaction Mechanisms

Biological Systems Engineering

BSE 5504G	Advanced Bioprocess Engineering
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Chemical Engineering

CHE 5304G	Advanced Biological Transport Phenomena
CHE 5544G	Advanced Protein Separation Engineering

Vet Medicine

VMS 4074	Pharmacology
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SUGGESTED COURSES FOR CATALYSIS

Chemistry

CHEM 5404	Advanced Inorganic Chemistry
CHEM 5525-5526	X-Ray Crystallography (cross-listed with GEOS 5535-5536)
CHEM 5644	Colloid and Surface Chemistry
CHEM 5664	Chemical Kinetics
CHEM 6164	Current Topics in Analytical Chemistry (NMR)
CHEM 6434	Organometallic Chemistry

Geological Sciences

GEOS 5535-5536	X-ray Crystallography (cross-listed with CHEM 5525-5526)
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Physics

PHYS 4554	Introduction to Solid State Physics
PHYS 5555-5556	Solid State Physics
PHYS 6555-6556	Advanced Solid State Physics

SUGGESTED COURSES IN COLLOIDS AND INTERFACES

Chemical Engineering

CHE 5334G	Colloid & Interface Science
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Chemistry

CHEM 5644	Colloid and Surface Chemistry
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Engineering Science and Mechanics

ESM 5264	Mechanisms of Adhesive Bonding and Interfaces
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Materials Science and Engineering

MSE 5114	Materials Characterization
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SUGGESTED COURSES FOR COMPUTATIONAL SCIENCE AND ENGINEERING

Biochemistry

BCHM 5024 Computational Biochemistry for Bioinformatics

Computer Science

CS 4214 Simulation & Modeling

Mathematics

MATH 5474 Finite Difference Methods for Partial Differential Equations
MATH 5484 Finite Element Methods for Partial Differential Equations
MATH 5515 Mathematical Methods for Modeling and Simulation of Biological Systems

Physics

PHYS 5794 Computational Physics

SUGGESTED COURSES IN POLYMER MATERIALS

Chemical Engineering

ChE 4214 Introduction to Polymer Materials
ChE 4224 Introduction to Polymer Processing
ChE 5564 Non-Newtonian Fluid Mechanics (crosslisted as ESM 5564)

Chemistry

CHEM 4534 Organic Chemistry of Polymers
CHEM 5644 Colloid and Surface Chemistry
CHEM 6674 Physical Chemistry of Polymers

Engineering Science and Mechanics

ESM 5044G Advanced Mechanical Composite Materials
ESM 5174 Polymer Viscoelasticity
ESM 5734 Introduction to the Finite Element Method
ESM 6734 Finite Element Analysis

SUGGESTED COURSES FOR POLYMER PROCESSING

Chemical Engineering

ChE 4224	Introduction to Polymer Processing
ChE 5564	Non-Newtonian Fluid Mechanics

Chemistry

CHEM 4074	Laboratory in Polymer Science
CHEM 4534	Organic Chemistry of Polymers
CHEM 4634	Polymer and Surface Chemistry
CHEM 6674	Physical Chemistry of Polymers

Engineering Science and Mechanics

ESM 5174	Polymer Viscoelasticity
ESM 4734	Introduction to Finite Elements
ESM 5014	Introduction to Continuum Mechanics
ESM 5734	Introduction to Finite Element Method

Macromolecular Science

MACR 5015-5016	Macromolecular Fundamentals Laboratory I & II
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SUGGESTED COURSES FOR SURFACE SCIENCE

Chemistry

CHEM 5124	Analytical Spectroscopy
CHEM 5404	Advanced Inorganic Chemistry
CHEM 5644	Colloid and Surface Chemistry
CHEM 6434	Organometallic Chemistry
CHEM 6634	Quantum Chemistry & Spectroscopy

Physics

PHYS 4554	Introduction to Solid State Physics
PHYS 5455-5456	Quantum Mechanics
PHYS 5555-5556	Solid State Physics

APPENDIX B

PLANS OF STUDY

The plan of study form can be obtained on the Chemical Engineering website (www.che.vt.edu). The student should complete this form and have his/her advisory committee approve it by signing the form. The student should then bring the approved copy to the Graduate Coordinator who will process the plan of study electronically. The plan of study is approved, first by the Department Head and then by the Graduate School. After the Graduate School has approved the plan, a copy will be placed in the student's file for reference. The student will also receive a copy for his/her files. Students may also access their approved plan of study through HOKIE SPA.

Plan of Study Forms

- MEng Degree – Non-Thesis Form

- MEng Degree – Project & Report Form

- MS Degree Form

- PhD Degree Form

For students entering Fall 2014 and after:

Attended Ethics and Integrity Seminar

Semester/Year _____

Completed on-line Responsible Conduct of Research course

Semester/Year _____

SIGNATURES OF STUDENT’S ADVISORY COMMITTEE:

<i>Name</i>	<i>Department</i>	<i>Signature(s)</i>
_____ (chair or co-chair)	_____	_____
_____ (co-chair)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____

Note:

Advisory committee should include at least **three** committee members. At least **one** other faculty member, in addition to the research advisor, should be from the ChE Department.

For students entering Fall 2014 and after:

Attended Ethics and Integrity Seminar Semester/Year _____
Completed on-line Responsible Conduct of Research course Semester/Year _____

TOTAL RESEARCH & COURSE CREDIT HOURS: _____
(Minimum: 30 hours)

SIGNATURES OF STUDENT’S ADVISORY COMMITTEE:

<i>Name</i>	<i>Department</i>	<i>Signature(s)</i>
_____ (chair or co-chair)	_____	_____
_____ (co-chair)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____

Note:

Advisory committee should include at least **three** committee members. At least **one** other faculty member, in addition to the research advisor, should be from the ChE Department.

updated 10/2018

For students entering Fall 2014 and after:

Attended Ethics and Integrity Seminar Semester/Year _____

Completed on-line Responsible Conduct of Research course Semester/Year _____

Transfer Courses

<i>Course Number & Title of Course</i>	<i>Name of School</i>	<i>Semester/Year Taken</i>	<i>Grade Received</i>	<i>Credit Hours</i>

Total Transfer Credit Hours: _____

TOTAL RESEARCH & COURSE CREDIT HOURS: _____
(Minimum: 30 hours)

SIGNATURES OF STUDENT’S ADVISORY COMMITTEE:

<i>Name</i>	<i>Department</i>	<i>Signature(s)</i>
_____ (chair or co-chair)	_____	_____
_____ (co-chair)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____

For students entering Fall 2014 and after:

Attended Ethics and Integrity Seminar Semester/Year _____

Completed on-line Responsible Conduct of Research course Semester/Year _____

Transfer Courses

<i>Course Number & Title of Course</i>	<i>Name of School</i>	<i>Semester/Year Taken</i>	<i>Grade Received</i>	<i>Credit Hours</i>

Total Transfer Credit Hours: _____

TOTAL RESEARCH & COURSE CREDIT HOURS: _____

(Minimum: 90 hours)

SIGNATURES OF STUDENT’S ADVISORY COMMITTEE:

<i>Name</i>	<i>Department</i>	<i>Signature(s)</i>
_____ (chair or co-chair)	_____	_____
_____ (co-chair)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____
_____ (member)	_____	_____

APPENDIX C

CHECKLISTS

Please use the following checklists to help you determine what needs to be completed in order for you to meet the requirements for your degree. These forms are also located on our Chemical Engineering website under the Graduate Resources tab.

Checklist for MEng Degree (Non-Thesis Option)

Checklist for MEng Degree (Project & Report Option)

Checklist for MS Degree

Checklist for PhD Degree

**CHECK LIST FOR
MASTER OF ENGINEERING (MEng) GRADUATION
(Non-Thesis Option)**

1. Research advisor chosen during first semester.	
2. Plan of Study submitted and approved. (due by end of second academic semester)	
3. Core courses completed.	
4. Schedule final exam using the Request to Admit Candidate to Final Exam (Non-Thesis MEng) <i>(Grad coordinator will request form from Graduate School)</i>	
5. Application for Degree form* submitted to Graduate School before deadline. <i>(Use paper form on Graduate School website)</i>	

The Graduate Program Coordinator will get Department Head's signature for those forms that require it. She will sign for Department Staff Coordinator and make a copy for your student file. Student will need to take forms to Graduate School before deadline after signatures are obtained.

*Application for Degree deadlines are:
October 1 for Fall Semester commencement
March 1 for Spring Semester commencement

Updated 8/2019

**CHECK LIST FOR
MASTER OF ENGINEERING (MEng) GRADUATION
(Project & Report Option)**

1. Research advisor and project chosen during first semester.	
2. Plan of Study submitted and approved. (due by end of second academic semester)	
3. Core courses completed.	
4. Register for at least 3 hours of Project and Report (ChE 5904). <i>(Be sure to register for the number of hours listed on your plan of study).</i>	
5. Application for Degree form submitted to Graduate School before deadline.	
6. Final oral exam scheduled with Graduate School. <i>(should be scheduled no later than two weeks before exam date)</i>	

The Graduate Program Coordinator will get Department Head's signature for those forms that require it. She will sign for Department Staff Coordinator and make a copy for your student file. Student will need to take forms to Graduate School before deadline after signatures are obtained.

*Application for Degree deadlines are:
 October 1 for Fall Semester commencement
 March 1 for Spring Semester commencement

Updated 8/2019

**CHECK LIST FOR
MASTER OF SCIENCE (MS) GRADUATION**

1. Research advisor and project chosen during first semester.	
2. Plan of Study submitted and approved. (due by end of second academic semester)	
3. Core courses completed.	
4. If eligible for Start of Semester Defense Exception, complete form and submit to Graduate School at least 3 weeks before defense. <i>(must be approved before student can schedule exam)</i>	
5. Application for Degree form* submitted to Graduate School before deadline. <i>(Use form located on Hokie Spa)</i>	
6. Final oral exam scheduled with Graduate School. <i>(Should be scheduled no later than two weeks before exam date).</i>	
7. Final oral exam approved by all committee members.	
8. Electronically submit thesis no later than 2 weeks after defense. Payment of all ETD fees.	
9. Complete following forms which will be provided by Graduate Program Coordinator and turn in before leaving Blacksburg. <ul style="list-style-type: none"> • Alumni form (to provide contact information and job information) • SACs form • Turn in all keys to Business Manager 	

The Graduate Program Coordinator will get Department Head's signature for those forms that require it. She will sign for Department Staff Coordinator and make a copy for your student file. Student will need to take forms to Graduate School before deadline after signatures are obtained.

*Application for Degree deadlines are:
October 1 for Fall Semester commencement
March 1 for Spring Semester commencement

Updated 8/2019

**CHECK LIST FOR
DOCTOR OF PHILOSOPHY (PhD) GRADUATION**

1. Research advisor and project chosen during first semester.	
2. Core courses completed.	
3. Qualifying exams taken and passed.	
4. Plan of Study for MEng (non-thesis) submitted and approved (optional degree awarded on the way to PhD)	
5. Plan of Study for PhD submitted and approved. <i>(due by end of third academic semester)</i>	
6. Preliminary exam scheduled with Graduate School <i>(schedule at least 2 weeks before exam date)</i>	
7. For students receiving MEng degree: a. Schedule final exam for MEng by completing Request to Admit Candidate to Final Exam Form (Non-Thesis MEng) (Grad coordinator will request form from Graduate School). <i>(May be scheduled on same day as preliminary exam, but not at the same time).</i> b. Complete "Application for Degree" form for MEng submitted to Graduate School before deadline.* <i>(Use paper form on Graduate School website)</i>	
8. Preliminary Exam passed and approved.	
9. Seminar scheduled and presented to ChE Department	
10. If eligible for Start of Semester Defense Exception, complete form and submit to Graduate School at least 3 weeks before defense. <i>(must be approved before student can schedule exam)</i>	
11. Application for Degree form* for PhD submitted to Graduate School before deadline. <i>(use form available on Hokie Spa – Application for Degree should be completed before scheduling final exam)</i>	
12. Final oral exam for PhD scheduled with Graduate School <i>(should be scheduled at least 2 weeks before exam date)</i>	

13. Final oral exam approved by all committee members.	
14. Electronically submit dissertation to Graduate School. Pay all ETD fees. <i>(Dissertation should be submitted no later than 2 weeks after defense. Exemption will need to be requested by advisor if this cannot happen).</i>	
15. Complete following forms which will be provided by Graduate Program Coordinator and turn in before leaving Blacksburg. <ul style="list-style-type: none"> • Alumni form (to provide contact information and job information) • SACs form • Turn in all keys to Business Manager 	

The Graduate Program Coordinator will get Department Head's signature for those forms that require it. She will sign for Department Staff Coordinator and make a copy for your student file. Student will need to take forms to Graduate School before deadline after signatures are obtained.

*Application for Degree deadlines are:
October 1 for Fall Semester commencement
March 1 for Spring Semester commencement

GRADUATE FORMS

Most forms can be downloaded from the Graduate School's website (www.graduateschool.vt.edu) or by following the link on our Chemical Engineering website under the Graduate Resources tab.

The department's Independent Study form (on the following page) is located on our Chemical Engineering website.

**VIRGINIA TECH
GRADUATE SCHOOL
REQUEST FOR INDEPENDENT STUDY (5974)**

Please submit two weeks prior to the semester.

STUDENT INFORMATION	COURSE INFORMATION
1) Name: _____	1) Department: _____
2) Student's ID #: _____	2) CRN #: _____
3) Local Address: _____ _____	3) Term/Year: _____
_____	4) Instructor: _____
E-mail: _____	5) Instructor's ID #: _____
4) Major: _____	6) Date Request Submitted: _____
5) College: _____	7) Credit Hours: _____, P/F ONLY

8) Title of Proposed Study (limit to 30 characters):

ATTACH ADDITIONAL INFORMATION AS NEEDED

Give brief description of the study, objectives, materials, and methods, justification and method of evaluation.

APPROVALS:

Student _____

Advisor _____

Instructor _____

Department Head _____

Academic Dean _____