

Chemistry Graduate Student Handbook University of Virginia

2019-2020

(Update version: 10/07/2019)

INTRODUCTION

This summary is intended to provide answers to questions about the graduate program in Chemistry at the University of Virginia. A number of items summarized here are discussed in more detail in other University of Virginia publications such as the Graduate Record. You should become familiar with these resources and take full advantage of advice from the faculty and staff of the University for assembling a graduate educational experience that is optimal for you. Do not hesitate to raise any concerns that you may have with any faculty member or Susie Marshall, Graduate Studies Coordinator.

The description of the degree requirements contained herein is a primary statement of components of the requirements that are unique to the Chemistry Department. These requirements are not intended to displace the more general statement of the graduate degree requirements provided in the Graduate Record, which must be satisfied in all cases. We have provided an academic calendar, which includes a number of activities and deadlines. While we will generally provide reminders throughout the year, the ultimate responsibility for your program rests with you. Please consult this guide, which will be periodically updated [on-line](#), for the duration of your graduate experience.

2019-2020: GRADUATE PROGRAM ADMINISTRATION

Director of Graduate Studies: Brent Gunnoe, tbg7h@virginia.edu, ph. 982-2692, in Rm. 239

Graduate Studies Coordinator: Susie Marshall, sem8h@virginia.edu , ph. 924-7014, in Rm. 188

Graduate Student Council-President: Rob Dyer, rmd8va@virginia.edu, in CHEM 296

2019-2020 CALENDAR

First Semester

AUGUST, 2019

1-31	(only after registration).....	Entering Students-I.D. Cards produced – Observatory Hill Dining (Lower Level)
15	.....	Departmental Travel Award applications due for October 1 – December 31 travel
19-20	.....9:00 A.M-5:00 PM.....	General Chemistry TA Workshop (CHEM 1411-1611)- Dell 1, Rm. 105
21	..... 9:00 AM-12:00 P.M.....	General Chemistry TA Workshop (CHEM 1411-1611)- CHEM 1811 TAs will also attend this workshop-Dell 1, Rm. 105
21	.....12:00 PM – 6:00 pm	Lunch and Dean's Orientation – Entering Graduate Students only Newcomb Hall Ballroom
22	.....8:30 AM-5:00 PM	University-Wide TA Workshop -Nau Hall & Gibson Halls (Registration)
23	.....9:00 AM-1:00 PM	General Chemistry TA Workshop (CHEM 1411-1611)- CHEM 1811 TAs will also attend this workshop
	.....1:00 P.M-5:00 PM.....	Orientation, Safety Lecture and Chemistry assessment exam-Dell 1 Rm. 105 (Entering Graduate Students sign off with EHS for Safety Certification)
	.....3:00 PM.....	Department Safety Lecture-Environmental Health & Safety-GIL 130 (Entering Graduate Students do not attend-separate safety lecture at 1:00)
25	.....12:00 PM.....	Opening Convocation for Incoming Students on the Lawn
26	.....	Advising and Registration
	.....10:00 AM.....	Advising: Bio Anal-Rm. 190 Biol.-PLSB 230, Mol. Design-PLSB 030, Spec & Dyn-PLSB 430
27	.....	Classes Begin
30	.....	Last Day to Enroll/Register on SIS without incurring ~\$70 late fee and considerable added bureaucracy to clear Holds on enrollment.

SEPTEMBER

10	.....	Last Day for Adding a Course
15	.....	Health insurance waiver application due if opting out of UVA Health plan
30	.....	Last Day for Filing Degree Applications for December 2018

OCTOBER

5-8	.....	Reading Days
9	.....	Classes Resume
15	.....	Drop Deadline to have Courses Removed from Transcript
22	.....	Late Drop with W Grade
31	.....	Returning Graduate Course Enrollment via SIS for Spring Semester 2018

NOVEMBER

15	.....	Research Advisor Selection Due (Entering Fall) Departmental Travel Award applications due for Jan. 1 - March 31 travel
27 (through Dec 1)	.....	Thanksgiving Recess
30	.....	Master's Thesis or Doctoral Dissertation Due for 12/2019 Graduation

December

2	.....	Classes Resume
	.....	Graduate student enrollment via SIS for Spring Semester 2018
6	.....	Classes End
8, 12, 15	.....	Reading Days
9-17	.....	Course Examinations
17	.....	Fall Degrees Conferred

2019-2020 Calendar

Second Semester

JANUARY, 2020

7	.....	Candidacy Publication Assigned to 2 nd Year Students
13	.....	Classes begin
27	.....	Last Day Students Can Enroll for Classes via SIS
21	.....	2 nd Year Written Thesis Research Overview Due
28	.....	2 nd Year Written Publication Critique Due
31	.....	Last Day for Filing Graduate Degree Application for May 2020 Graduation

FEBRUARY

4, 5, 6 & 7	.....	2 nd Year Ph.D. Candidacy Examinations
5	.....	Last Day for Adding Courses
8	.....	Drop Deadline for Having Courses Removed From Transcript
12	.....	Time Line to Ph.D. Completion & Funding Requests Due for Ph.D. Students Beyond 4 th Year
15	.....	Departmental Travel Award applications due for April 1 - June 30 travel

MARCH

6	.....	Last Day of Classes Before Spring Recess
7-15	.....	Spring Recess
16	.....	Classes Resume
16	.....	Research Advisory Committee Selection Due (Entering Fall)
18	.....	Late Drop with W Grade
30	.....	Course Enrollment via SIS Begins for Fall Semester 2020

APRIL

9	.....	3 rd Year Ph.D. Student Poster Session
15	.....	Research Advisor Selection Due (Entering January)
28	.....	Classes end
29	.....	Reading Day
30 (through May 8)	.....	Course Examinations Doctoral Dissertation and Master's Thesis Due for May 2020 Graduation Deadline for submitting dissertation title in pdf form to Graduate Studies Coordinator (Susie Marshall) for May 2020 graduation

MAY

1	.....	Research Advisory Committee Selection Due (Entering January)
3,6	.....	Reading Days
15	.....	Departmental Travel Award applications due for July. 1 - September 30 travel
15-17	.....	Final Exercises
31	.....	Annual Research Report & CV Due (for 3 rd year students and above)

JUNE

5	.....	Continuous Enrollment forms due for summer
30	.....	Last day to apply for August graduation in SIS

JULY

15	.....	Doctoral/Thesis Completion Petition due (if applicable)
7/7-8/2	.....	CAELC (EAP) Summer Intensive Language Course for non-native English speakers
31	.....	Deadline for submitting all August graduation materials to the Graduate School

One Year M.A. Program

Description

This self-financed M.A. program is designed for students wanting an advanced degree based primarily on coursework. The program provides a path to industrial jobs, professional schools, teaching careers, Ph.D. programs, or it can be used as part of an interdisciplinary career portfolio. The program, usually comprised of ten graduate courses in Chemistry or related disciplines, is normally completed in one academic year. For international students an important parallel component of the M.A. program are activities and classes designed to improve English fluency provided through the Center for American English Language and Culture (CAELC). Further M.A. program details are available at <http://chem.virginia.edu/graduate-studies/the-m-a-program/>.

Registration

Students pursuing the one year M.A. should enroll in graded and/or research courses for a total of 15 credit hours each semester. Three of these credit hours can be research.

2019-2020 Calendar (M.A. specific dates)

JULY 2019

7 Center for America English Language and Culture (CAELC) - Orientation and classes begin: Sunday, July 7, 2019 & continue until August 2, 2019.*

AUGUST

7 Course Enrollment via SIS for Fall Semester 2017
19 CAELC August SPEAK test and enrollment in CAELC courses*
21 GSAS Orientation for new graduate students in Newcomb Hall Ballroom will take place between 4:00 and 6:00 pm
22 1:00 PM Orientation and Assessment Exam - PLSB 230
23 9:00 AM M.A. Advising and Desk assignments in research labs – PLSB 230
..... 3:00 PM Department Safety (attendance required) – MEC 205
27 Academic classes begin. CAELC suggested ESL courses begin**
..... Weekly semi-private English tutoring from CAELC begins*

NOVEMBER

1 Course Enrollment via SIS for Spring Semester 2020
Mid-November TOEFL test in Lynchburg, VA*

DECEMBER

10 CAELC December SPEAK test*

JANUARY 2020

31 Last Day for Filing Graduate Degree Application for May 2020 Graduation

May

5 CAELC May SPEAK test*

* Once a student is enrolled in an ESL course, they must complete the course and achieve a grade of Satisfactory. They may petition the Director of Graduate Studies during the term, but not afterwards, to withdraw from the course.

ADMISSION AND ORIENTATION

ADMISSION

Admission to the graduate program in chemistry is based on a student's previous college record, letters of recommendation and related experience. In a few cases, students may be admitted as continuing education students because they do not appear to have the necessary background for entering the degree program directly. Such students may be admitted to the degree program upon satisfactory demonstration that they can perform at a requisite level to complete degree requirements satisfactorily.

ADVISING

The Graduate Studies Committee has the primary responsibility for advising students who have not chosen research advisers. First year students should consult with their assigned faculty adviser before making any registration changes such as dropping a course. The usual expectation is that all students will complete five to six graduate level courses during the first year, excluding professional development seminars (CHEM 70xx) and topical research. Completing fewer courses may delay the student's program and may prevent attainment of Ph.D. candidacy. Completion of six graduate level courses by the end of the fourth semester is required.

After research adviser selection, the Graduate Studies Committee, in consultation with the research adviser and the student, will establish a three-person committee to serve as the student's research advisory committee. This committee will monitor the student's subsequent research and academic progress. The three-person committee will review the student's research progress periodically beginning in the fourth semester and, so far as practical, serve on the preliminary qualifying examination for admission to candidacy and the final dissertation examination committee.

REGISTRATION

All students are required to register for at least 12 credit hours every fall and spring semester until a degree is granted. First year graduate students should register for 15 credit hours/semester and upper year students should register for 12 credit hours/semester. At least 72 credit hours (comprising at least 24 credit hours of course work) are required for a Ph.D. degree, and at least 30 credit hours (comprising at least 24 credit hours of course work) are required for a Master's Degree. After all course requirements are met, students typically register for credit hours of 9xxx-level topical research under their research advisor sufficient to fill their 12 credit hours/semester requirement.

Only students planning to graduate during the summer with their thesis defense completed before August 1 need to register for summer session. Domestic students can do so by registering for 6 credit hours. International students graduating in the summer must register for 6 credit hours of summer session to keep their visa current.

THE HONOR CODE

The University of Virginia operates with an honor system. You are responsible for understanding this honor system both as a student and as a teaching assistant. In addition, the foundation of graduate work is the pursuit of new knowledge based on the most rigorous application of the scientific method. Violations of scientific integrity such as fabrication of data, plagiarism, or misrepresentation of data are taken seriously, not only by the Chemistry Department and the University, but also by the various

U.S. Government agencies that fund the bulk of the graduate research performed in the Chemistry Department. Ethical violations can result in dismissal from the program.

FACILITIES

SAFETY, SECURITY AND HOUSEKEEPING

PLEASE MAKE SURE THAT APPROPRIATE PRACTICES ARE ROUTINE.

Building security is important for the personal safety of all of us because of potential hazards caused by uninformed people entering research areas. Please report suspicious behavior to the Chemistry Department office (4-3344) or to UVA Security (4-7088). After hours, building doors to the research areas are locked. Help maintain security in these areas by keeping these doors closed and locked.

Safety depends on the attention to almost every detail in the laboratory. We ask for your help in maintaining the building in a safe configuration by the removal of clutter, the correct disposal of chemical waste, and by your attention to the health hazards of chemicals used in the laboratory.

Safety goggles or glasses are required anytime experimental work is in progress. Teaching Assistants must wear safety goggles or glasses when in the undergraduate laboratories. Contact lenses pose a particular hazard when doing chemistry because of the added difficulties of flushing the eye following a chemical splash or spill. Their use is discouraged.

There may be experiments that you will need to leave unattended. In such cases, leave information clearly visible that instructs an emergency worker about the character of the experiment, solvents, etc. Make sure that you have minimized fire and flood potential any time you have an experiment running. Water pressures change throughout the day; therefore, if water hose connections are used, tighten those connections with wire (or similar) to secure them against failure. Examine sink drains to make sure water will flow freely.

For chemicals that must be stored cold, use an explosion-proof refrigerator. Do not place food in a chemical refrigerator, and do not eat in chemical laboratory space. People working with radioactive materials must be trained and competent in the safe use of such materials.

As a safety precaution, no one is permitted in the laboratories or stockrooms without proper clothing. Teaching Assistants are expected to enforce this policy in their undergraduate laboratory section.

We will provide a chemical safety manual prepared by the Department of Environmental Health and Safety. It is your responsibility to read, understand, and follow the procedures contained in that manual. In addition, each research group has safety materials specific to the procedures, chemicals, equipment, etc. in that group.

Bring any safety concern to the immediate attention of the Department Chair.

EMERGENCY 9-911

ENVIRONMENTAL HEALTH & SAFETY 2-4911

STUDENT ID BADGES

Entering Ph.D. and M.A. students may obtain a SMART student ID badge at the University ID Card Office which is located on the corner of Alderman and McCormick Roads in the Observatory Hill Dining Hall, Lower Level. Meter parking is available on McCormick Road. Their office hours are 8:00 a.m. - 5:00 p.m., Monday-Friday. There will be a \$5.00 charge for the badge. Your names will be submitted for approval before you arrive. If any problems arise please see Susie Marshall (Graduate Studies Coordinator in Rm. 188 or email at sem8h@virginia.edu).

KEYS

Graduate students may obtain keys to the building and laboratories from Ed de Bary in Room 465. Keys must be returned upon termination of your appointment.

MAIL

Student mail is handled through the stockroom, and the mail for each research group is held there. Likewise, outgoing mail should be placed in the labeled basket provided at the Storeroom.

PROGRAM INFORMATION ON THE WEB

<http://chemistry.as.virginia.edu/graduate>

FINANCIAL SUPPORT

TEACHING ASSISTANTS

Service as a teaching assistant for a minimum two semesters is required for a departmentally-financed M.S. or Ph.D. degree. The gross stipend after payment of tuition and fees for the academic year 2019-2020 is \$20,000. This stipend is paid over 20 bi-weekly pay dates. The first pay date for the fall semester will be Friday, August 30 and you will receive a paycheck every other Friday. The Chemistry Department pays all academic year tuition and fees directly to the Bursar's Office. Certain students may have been awarded additional fellowships on the basis of outstanding promise or accomplishments. No taxes of any type are deducted from these fellowship payments, and it is the student's responsibility to determine the extent of tax liability for this financial assistance.

Teaching assistants have a responsibility to be present at all times in the laboratories, tutorial sessions and recitation section to which they have been assigned. Teaching assistants are professional members of the teaching staff of the Chemistry Department, and it is an expectation that they will provide undergraduate students with a high quality of education. Teaching Assistants normally have 5-10 contact hours per week, which may require a total investment of 15-20 hours per week including time for grading examinations, quizzes, and laboratory reports. As a representative of the University of Virginia, teaching assistants are required to follow the regulations of the University with respect to all aspects of their professional conduct. Trading duties with other assistants to accommodate social obligations is inappropriate. At some time during the year you may have to miss a teaching assignment because of illness or other unavoidable circumstance. It is your responsibility to arrange for someone to cover your assignment and to inform the individual in charge of the course of this substitution.

RESEARCH ASSISTANTS

Research assistantships are generally awarded from research grants to students to pursue their thesis research and are based on good academic standing and a record of due diligence with respect to achieving the goals of their research program. Funds for research assistantships are awarded based on the recommendation of the individual faculty member responsible for the grant.

The gross stipend for research assistants after tuition and fees for the academic year 2019-2020 is \$20,000. This stipend is paid over 20 bi-weekly pay dates. The first pay date for the fall semester will be Friday, August 30 and you will receive a paycheck every other Friday. The Chemistry Department pays all academic year tuition and fees directly to the Bursar's Office. Certain students may have been awarded additional fellowships on the basis of outstanding promise or accomplishments. No taxes of any type are deducted from these fellowship payments. It is your responsibility to determine the extent of tax liability for this financial assistance.

SUMMER RESEARCH ASSISTANTSHIP AWARDS

The summer 2020 net stipend after payment of tuition and fees is \$7,000 for graduate research assistants. This stipend will be paid in 6 bi-weekly payments. During the summer months, you will not be enrolled for classes and as a result your summer pay will be subject to the 7.65% FICA tax. Summer research assistantships are the responsibility of faculty advisors and depend upon adequate external research support.

CONTINUATION OF FINANCIAL AID

The Chemistry Department provides financial assistance to as many of the graduate students as possible in the form of teaching and research assistantships or fellowships. Continued support is dependent upon available departmental resources and satisfactory progress by the student.

Students who terminate degree programs or transfer to other Departments of the University will no longer be eligible for appointment as teaching assistants or fellowships beyond the semester in which the transfer takes place or the degree is awarded.

UNIVERSITY AND EXTERNAL FELLOWSHIPS

Chemistry graduate students are eligible for fellowships from the Graduate School and the Chemistry Department, as well as competitive federal, industrial, and foundational fellowships derived independently and external to the University. Students are able to retain a level of GSAS living support in combination with externally awarded living support up to a threshold of 130% of the department's standard living support offered upon admission. Some external fellowships mandate even higher living support which is honored. Generally, taxes are not deducted from fellowship payments. It is your responsibility to determine the extent of tax liability for this financial assistance.

UNIVERSITY RECESSES

The responsibility of teaching assistants generally begins with the organization meeting at the beginning of each term and ends when the laboratory check-out is complete and the final examination in the course has been graded and recorded. After these responsibilities have been completed, a student may take recess from teaching responsibilities until the organizational meetings of the following semester. Other requirements of the graduate program may require students to be on grounds when classes are not in session; e.g., research activities, etc. Once an adviser is selected, it is the student's

responsibility to schedule his/her time in concert with the research activities in the adviser's group. It is generally understood that students will take a maximum of 22 days of annual leave including holidays.

OUTSIDE EMPLOYMENT

It is expected that students receiving normal levels of financial support through teaching assistantships, research assistantships or fellowships will devote themselves completely to their graduate program of study and research. Therefore, students are expected to refrain from employment outside of the Chemistry Department when appointed full-time in teaching or research assistantship or a fellowship. In cases where the student and the research advisor deem additional employment appropriate, the student must send a request via e-mail to the Director of Graduate Studies (DGS) that describes his or her progress toward the degree, the proposed weekly level of outside effort and payment details, the rationale for the overload, and confirmation of whether the student holds an international visa (if applicable). If the DGS supports the request, he or she will forward the e-mail to the GSAS assistant dean with an endorsement, confirming the justification provided by the student. The GSAS assistant dean will review and respond to the petition.

HEALTH MATTERS

Ph.D. students are provided with [healthcare](#) on an annual basis with a start/renewal date of August 15. If a student has comparable healthcare provided externally (e.g., by their parents) and would like to waive the UVa healthcare they can do so and receive a modest financial compensation.

The university provides up to 6 weeks of paid maternity leave for graduate students who give birth to a child while supported as a graduate teaching assistant or graduate research assistant. To request maternity leave, the student should send an email to the Director of Graduate Studies, who will forward the request with endorsement to GSAS. If approved, [the student will receive notice of the relief from GSAS. The Family Medical Leave Act is only involved if the student will be taking additional unpaid time beyond the six-week funded relief period.](#) For more information, see:

<https://uvapolicy.virginia.edu/policy/PROV-028>

DEPARTMENTAL ACADEMIC REQUIREMENTS

The Graduate Program in Chemistry will provide a platform from which one may build expertise and continue a life-long process of inquiry and growth. It is not the intention of this program to provide detailed training in every aspect of chemistry or its applications. Rather, it is our goal to provide the fundamentals for a much-expanded personal development, provide the environment where intellectually active people may thrive, and provide the facilities to conduct research to advance new chemistry and science. The faculty members provide a number of aids in this process of preparation including graduate courses, seminars, examinations, and considerable personal assistance and advice. Although the emphasis of graduate education is on student initiative, all programs have several mileposts to assist both the faculty and students.

I. The First Year of Study

A. Areas of Study

Although graduate students are not formally assigned to a sub-discipline, the department has identified six broad areas of study in which graduate courses are categorized. Listing of courses in these areas is not intended to set requirements. Each student's course selection is based on his/her research and professional interests and are set based on consultation with faculty advisors. The goal of course listing by subdisciplines is to provide examples of collections of courses that students with similar research interests might take. The six areas are defined as follows:

Molecular Design: Study of the design and synthesis of molecular structures with specific properties and testing of those properties.

Spectroscopy and Dynamics: Development of new tools for quantitative measurement and prediction of molecular properties and chemical processes.

Chemical Biology: The use of chemical tools to understand functions in biological systems.

Bioanalytical Chemistry: Development of new quantitative tools for biological applications.

Quantitative and Physical Biochemistry: experimental and computational characterization of the structures, dynamics, molecular function and properties of biomolecules and living systems.

Chemical Education: empirical explorations of students' thinking in chemistry and chemistry instructor's teaching practices.

B. Lecture Course Offerings (note: some chemistry course numbers/names have changed and not all UVA databases have caught up yet). Updated lists of courses offerings can be found at: <https://rabi.phys.virginia.edu/mySIS/CS2/>

Course #	Course Name	Fall/Spring
CHEM 5110	Organic Chemistry III: Structure, Reactivity, and Mechanism	Fall
CHEM 5120	Organic Chemistry IV: Synthesis	Spring
CHEM 5180	Instrumental Theory and Techniques in Organic Chemistry	Spring
CHEM 5210	Advanced Physical Chemistry I: Quantum Mechanics	Fall
CHEM 5220	Advanced Physical Chemistry II: Statistical Mechanics	Fall
CHEM 5224	Reaction Kinetics and Dynamics	Spring
CHEM 5250	Molecular Spectroscopy	Spring
CHEM 5260	Introduction to Astrochemistry	Fall
CHEM 5310	Advanced Inorganic Chemistry I: Reaction Mechanisms	Fall
CHEM 5320	Advanced Inorganic Chemistry II: Organometallics and Synthesis	Fall
CHEM 5330	Structural Inorganic Chemistry: Characterization and Spectroscopy	Spring

CHEM 5340	Nanomaterials: Synthesis, Properties, and Applications	Spring
CHEM 5350	Main Group Inorganic Chemistry	Fall
CHEM 5360	Materials Chemistry for Future Energy Needs	
CHEM 5380	Determination of Molecular Structure by Diffraction Methods	Spring
CHEM 5410	Advanced Biological Chemistry I: Molecular Assembly and Information Flow	Fall
CHEM 5420	Advanced Biological Chemistry II: Macromolecular Structure and Function	
CHEM 5430	Nanoscale Imaging of Complex Systems in Chemistry and Biology	Spring
CHEM 5510	Selected Topics in Organic Chemistry (Drug Discovery)	
CHEM 5520	Selected Topics in Physical Chemistry	
CHEM 5530	Selected Topics in Inorganic Chemistry	
CHEM 5540	Selected Topics in Biological Chemistry (Drug Discovery)	Spring
CHEM 5570	Selected Topics in Analytical Chemistry (Luminescence)	
CHEM 5559	New Course in Chemistry	
CHEM 5710	Advanced Analytical Chemistry	
CHEM 5720	Methods in Bioanalytical Chemistry	
CHEM 5740	Analytical Chemistry: Separations	Fall
CHEM 5750	Analytical Chemistry: Spectroscopy	
CHEM 7010	Research Seminar I: Introduction to Research	Fall
CHEM 7011	Teaching Science in Higher Education	
CHEM 7020	Research Seminar II: Research, Innovation, Entrepreneurship, and Ethics	Spring
CHEM 7021	Communicating Research to Diverse Audiences	Spring
CHEM 7030	Research Seminar III: Preparation for Ph.D. Candidacy Exam	Fall
CHEM 7031	The Art of Scientific Writing	Fall

Below is a listing of graduate level courses that are offered outside the Chemistry Department and can be taken to fulfill the graduate course requirements. Additional outside courses can be added to this list by petition to the Graduate Studies Committee that the course provides Ph.D.-level knowledge that is essential to the student's research progress.

BIOLOGY

BIOL 7320 Signal Transduction: How Cells Talk to Each Other

BIOPHYSICS

BIOP 5060 Molecular Physiology: From Molecular Machines to Biological Information Processing

BIOP 8020 Advanced Protein Crystallography

BIOP 8030 Magnetic Resonance Spectroscopy of Macromolecules

BIOMEDICAL ENGINEERING

BME 6101 Engineering Physiology 1

BME 6102 Engineering Physiology 2
BME 6310 Instrumentation and Measurement in Medicine I
BME 7641 Bioelectricity
BME 7806 Biomedical Application of Genetic Engineering
BME 8783 Advanced Magnetic Resonance Imaging

BIOMEDICAL SCIENCE

BIMS 5012 Cell Structure Function
BIMS 7100 Research Ethics
BIMS 8131 Topics in Molecular Basis of Human Disease
BIMS 8192 Biotechnology Research Seminar
BIMS 8200 Fundamental Immunology
BIMS 8380 Practical Use of Statistics in Biomedical Research

CHEMICAL ENGINEERING

CHE 5561 Special Topics in Chemical Engineering (e.g, Computational Chemistry in ChE)
CHE 5562 Special Topics in Chemical Engineering (e.g, Energy Science and Engineering)
CHE 6030 Green Engineering and Sustainability
CHE 6442 Applied Surface Chemistry
CHE 6447 Biochemical Engineering
CHE 6448 Bioseparations Engineering
CHE 6615 Advanced Thermodynamics
CHE 6665 Techniques for Chemical Engineering Analysis and Design

COMPUTER SCIENCE

CS 5014 Introduction to Programming for non-CS Graduate Students / Computation as a Research Tool
CS 6160 Theory of Computation
CS 6161 Design and Analysis of Algorithms
CS 6444 Introduction to Parallel Computing

EDUCATION

EDLF 5260 Cognitive Psychology and Education
EDLF 5330 Quantitative Methods and Data Analysis I
EDLF 7404 Qualitative Analysis
EDLF 7410 Mixed Methods Research Design

ENGINEERING – APPLIED MATHEMATICS

APMA 6150 Linear Algebra
APMA 6430 Statistics for Engineers and Scientists
APMA 6440 Applied Partial Differential Equations

ENVIRONMENTAL SCIENCES

EVGE 5850 Geochemistry
EVGE5860 Isotope Geochemistry

MATERIALS SCIENCE AND ENGINEERING

- MSE 6020 Defects and Microstructure in Materials
- MSE 6080 Chemical and Electrochemical Properties
- MSE 6130 Transmission Electron Microscope
- MSE 6230 Thermodynamics and Phase Equilibria of Materials
- MSE 6592 Topics in Materials Science
- MSE 6670 Electronic, Optical and Magnetic Properties of Materials
- MSE 7220 Surface Science
- MSE 7592 Advanced Topics in Materials Science

MECHANICAL AND AEROSPACE ENGINEERING

- MAE 6592 Introduction to Density Functional Theory (DFT) and Electronic Structure Calculations

MATH

- MATH5210 Advanced Calculus with Applied Mathematics
- MATH5220 Partial Differential Equations and Applied Mathematics
- MATH5651 Advanced Linear Algebra

MOLECULAR PHYSIOLOGY AND BIOLOGICAL PHYSICS

- PHY 5060 Molecular Physiology: From Molecular Machines to Biological Information Processing
- PHY 8130 Structure and Function of Biological Membranes

NEUROSCIENCE

- NESC 7030 Neurobiology

PHARMACOLOGY

- PHAR 9010 Human Pharmacology
- PHAR 9020 Molecular Characterization of Drug Targets
- PHAR 9080 Biochemical Pharmacology

PHYSICS

- PHYS 5190 Electronics Lab
- PHYS 5310 Optics
- PHYS 5320 Fundamentals of Photonics
- PHYS 5620 Introduction to Solid State Physics
- PHYS 5630 Computational Physics I
- PHYS 5820 Introduction to NanoPhysics
- PHYS 7420 Electricity and Magnetism I
- PHYS 7610 Quantum Theory I
- PHYS 8260 Ultrafast Laser Spectroscopy
- PHYS 8310 Statistical Mechanics

C. Graduate Course Requirements

In the Graduate School, a minimum cumulative GPA of 3.0 (B) must be maintained and the minimum passing course grade is B-. Students must successfully complete 18 credit hours of research-relevant courses for grade, typically during the first year, but certainly before completion of their 2nd year (and, generally, before the 2nd year candidacy exam). Students must also successfully complete 12 credit hours of professional development courses which are the 7010, 7011, 7020, 7021, 7030 and 7031. These professional development courses are taken sequentially in 70x0/70x1 pairs over 3 semesters for all Ph.D. students and are not considered among the 18 credit hours of research-relevant graded courses. Nevertheless, 7010 and 7020 do contribute 6 credit hours towards the graduate school degree requirement of accumulating 24 credit hours of graded coursework. The area programs typically suggest several core courses that are foundational to the area whereupon other courses, both within the department and outside of it, are usually selected based on the particular research needs of the student. Grades in the research-relevant graded courses will be part of the evaluation process for admission to Ph.D. candidacy in February of the second year (i.e., the candidacy exam). Additional courses (i.e., beyond the 18 hour requirement) may be taken at any time with permission of the student's Research Advisor and the Director of Graduate Studies. First year students will enroll for 15 credit hours/semester and upper year students for 12 credit hours/semester. Representative courses for the first year of study are shown below:

Molecular Design Program

<u>Fall</u>	<u>Spring</u>
5110 Organic Chem. III	5180 Instrumentation for Synthesis
5310 Adv. Inorganic Chem. I	5330 Structural Inorganic Chemistry ...
7010* Research Seminar I	7020* Research Seminar II
7011* Teaching Science	7021* Communicating Research

* Professional development courses required for all students

Other courses, such as 5120 Organic Chem. IV, 5320 Adv. Inorganic Chem. II, 5410/20 Adv. Biological Chem., 5730/40 Adv. Analytical Chem., 5224 Reaction Kinetics and Dynamics, etc., or enrollment in some hours of CHEM 9999 Doctoral Research (typically 2 hours in the Fall), or CHEM 9xxx Topical Research once a research advisor has been established, are often chosen to round out the first year. Completion of the required 18 hours of research-relevant graded courses may occur in the second year (first semester) for scheduling reasons.

Bioanalytical Chemistry Program

<u>Fall</u>	<u>Spring</u>
5410 Adv. Biological Chem. I	5420 Adv. Biological Chem. II
5730 Adv. Analytical Chem.	5720 Methods in Bioanalytical Chem.
5740 Analytical Chem.: Separations	7020* Research Seminar II

7010* Research Seminar I
7011* Teaching Science

7021* Communicating Research

* Professional development courses required for all students

Other courses, such as 5711 Computer Interfacing, 5180 Instrumentation for Synthesis, 5430 Nanoscale Imaging, 5250 Molecular Spectroscopy, 5380 Molecular Structure by Diffraction, MSE 6130 Electron Microscopy, PHYS 5190 Electronic Lab, APMA 6430 Statistics for Scientists, CS 6014 Computing for Scientists, BME 6101/2 Engineering Physiology, etc., or enrollment in some hours of CHEM 9999 Doctoral Research (typically 2 hours in the Fall), or CHEM 9xxx Topical Research once a research advisor has been established, are often chosen to round out the first year. Completion of the required 18 hours of research relevant graded courses may occur in the second year (first semester) for scheduling reasons.

Spectroscopy and Dynamics Program

Fall

5210 Adv. PChem. I-Quantum Mech.
5220 Adv. PChem. II-Statistical Mech.
7010* Research Seminar I
7011* Teaching Science

Spring

5224 Kinetics and Dynamics
5250 Molecular Spectroscopy
7020* Research Seminar II
7021* Communicating Research

* Professional development courses required for all students

Other courses, such as 5260 Intro. to Astrochem., 5730/40 Adv. Analytical Chem., 5410/20 Adv. Biological Chem., 5430 Nanoscale Imaging, PHYS 5310 Optics, PHYS 5620 Solid State Physics, CS 6014 Computing for Scientists, MSE 6670 Electronic, Optical, and Magnetic Properties of Materials, etc., or enrollment in some hours of CHEM 9999 Doctoral Research (typically 2 hours in the Fall), or CHEM 9xxx Topical Research once a research advisor has been established, are often chosen to round out the first year. Completion of the required 18 hours of research relevant graded courses may occur in the second year (first semester) for scheduling reasons.

Chemical Biology Program

Fall

5410 Adv. Biological Chem. I
7010* Research Seminar I
7011* Teaching Science

Spring

5420 Adv. Biological Chem. II
7020* Research Seminar II
7021* Communicating Research

* Professional development courses required for all students

Other courses, such as 5110 Organic Chem. III, 5120 Organic Chem. IV, 5430 Nanoscale Imaging, 5720 Methods in Bioanalytical Chem., 5730/40 Adv. Analytical Chem., 5210/20 Adv. Phys. Chem., 5224 Kinetics and Dynamics, 5250 Molecular

Spectroscopy, BIOP 5060 Molecular Physiology, CS 6014 Computing for Scientists, MSE 6130 Electron Microscopy, etc., or enrollment in some hours of CHEM 9999 Doctoral Research (typically 2 hours in the Fall), or CHEM 9xxx Topical Research once a research advisor has been established, are often chosen to round out the first year. Completion of the required 18 hours of graded courses may occur in the second year (first semester) for scheduling reasons.

Quantitative and Physical Biochemistry Program

<u>Fall</u>	<u>Spring</u>
5410 Adv. Biological Chem I	5420 Adv. Biological Chem II
5220 Adv. Phys. Chem II- Stat. Mech.	8201/8301 Biophysical Principles I&II
7010* Research Seminar I	7020* Research Seminar II
7011* Teaching Science	7021* Communicating Research

* Professional development courses required for all students

Electives for the Fall semester include but are not limited to: ECE 6782 (Digital Image Processing), PHYS 5310 (Optics), CHEM 5310 (Adv. Phys. Chem I– Quantum), CHEM 5730 (Adv. Anal. Chem.), BME 6310 Computational Modeling in Biomedical Engineering, BIOP 8130/8311 (Biological Membranes), BIOP 8030/8031 (Magnetic Resonance), PHYS 5250 (Mathematical Methods for Physicists). Electives for the spring include CS 5014 (Computation as a research tool) or CHEM 5430 (Nanoscale Imaging). During the second year, CHEM 7030/7031 are required in the fall, and your advisor may recommend additional courses for either the fall and/or the spring semesters. Enrollment in some hours of CHEM 9999 Doctoral Research (typically 2 hours in the Fall), or CHEM 9xxx Topical Research (once a research advisor has been selected) may be chosen during the first year. It may be necessary to complete the required 18 hours of graded courses in the second year (first semester) for scheduling reasons.

Chemical Education

<u>Fall</u>	<u>Spring</u>
EDLF 5330 Quant. Methods & Data Anal.	XXXX CHEM course #2
XXXX CHEM course #1	XXXX CHEM course #3
EDLF 7404 Qualitative Analysis	EDLF 5260 Cognitive Psych. & Education
7010* Research Seminar I	7020* Research Seminar II
7011* Teaching Science	7021* Communicating Research

* Professional development courses required for all students

In a typical first year, students interested in Chemical Education are advised to take three education courses (EDLF) and three chemistry courses (listed as XXX Chem Course #x above). Chemistry courses should be focused in an area of interest, and course selection can be advised from the lists for sub-disciplines above. In addition, it is recommended in year 2 to take an additional chemistry graduate course as well as EDLF 7410 (Mixed Methods Research Design), which has been taught in the Fall semesters. During the second

year, CHEM 7030/7031 are required in the fall. Enrollment in some hours of CHEM 9999 Doctoral Research (typically 2 hours in the Fall), or CHEM 9xxx Topical Research (once a research advisor has been selected) may be chosen during the first year.

Additional Degree Requirements

Each first-year graduate student must submit a request for a faculty research adviser to the Graduate Committee by November 15 if beginning in Fall semester or by April 15 if beginning in Spring semester. The Graduate Studies Committee will consider all adviser selections. No selections are final until the Graduate Studies Committee has approved them. Barring extenuating circumstances, all approvals will be made before November 28 or April 25 (for students entering in January).

In consultation with his or her Research Advisor, each student must submit a list of potential advisory committee members on the Advisory Committee Form to the Graduate Committee by March 15 (or May 2 for students entering in January). After approval by the Graduate Committee, this group will become the student's primary advisory group.

II. Requirements for Master of Arts (M.A.) Degree

- A. Total course credit accumulation of at least 30 credit hours comprised of least 24 credit hours of successfully completed graded graduate courses in Chemistry or related fields with at least a B cumulative average (3.0 GPA). The minimum passing grade in any graduate course is B-. Both graded lecture and research coursework can provide credit hours towards the M.A. degree. Note that after award of an M.A. degree, it is not possible to gain a subsequent M.S. degree by simple addition of a M.S. thesis and its defense (coursework requirements would need to be satisfied anew).

III. Requirements for Master of Science (M.S.) Degree

- A. Successful completion of the core degree requirements and 7010 and 7020 with course grades of B- or better.
- B. Total course credit accumulation of at least 30 credit hours (comprised of at least 24 credit hours of graded coursework) with at least a B cumulative average (3.0 GPA).
- C. Completion of a research project and written thesis that must be approved by the student's Advisory Committee.
- D. Successful oral presentation of the thesis work in a seminar to faculty and students.
- E. Satisfactory performance in an oral examination following the thesis seminar.
- F. It is expected that students in this program will complete these requirements not later than their third year in residence.

- G. Failing these requirements, the student may be eligible for the M.A. degree and will be disqualified from pursuit of a Ph.D. degree in the Chemistry Department.

IV. Requirements for the Doctor of Philosophy (Ph.D.) in Chemistry

- A. Successful completion of the core degree requirements and 7010, 7011, 7020, 7021, 7030 and 7031 with grades of B⁻ or better.
- B. Total course credit accumulation of at least 72 credit hours (comprised of at least 24 credit hours of graded coursework) with at least a B cumulative average (3.0 GPA). For students who have [transferred some graduate credit hours](#) from another institution, at least 18 graded course credits applied toward the degree must have been earned at UVa.
- C. Successful completion of the Candidacy Examination that is described in detail below.
- D. Presentation of research in the third year poster session.
- E. Completion of a written dissertation that describes the research and presents results suitable for publication in the scientific literature. The dissertation must be approved by a Doctoral Examining Committee minimally comprised of:
 - 1. the student's Research Advisor and at least 2 members of the student's Research Advisory Committee. Emeritus faculty are eligible to participate in the core membership of the Committee. A faculty member external to the University, who holds a Ph.D., can be approved as part of the core Examining Committee if the Director of Graduate Studies can successfully petition the GSAS Assistant Dean of the rationale for the appointment and the alternate credentials and experience that qualify that faculty member to serve on the doctoral committee.
 - 2. a UVa tenured or tenure-track faculty member from outside the Chemistry Department.
- F. Successful oral presentation of the dissertation work in a seminar to faculty and students.
- G. Successful oral defense of the dissertation to the Doctoral Examining Committee.
- H. It is expected that these requirements will be satisfied before the end of the student's fifth year in residence. Extensions beyond five years may be granted with approval of the research advisor, the Graduate Studies Committee and the Graduate School.
- I. Failure to satisfy these requirements will preclude readmission to the Chemistry Department Doctoral Program. In such cases the student may be eligible for the M.S. or M.A. degree.

V. Supplementary Explanations

A. Selection of a Research Advisor

Upon arrival at UVa, new Ph.D. students will be assigned a desk in a research lab in their general area of interest (if space is available). Entering students are not assigned a research group, even if they have performed research over the previous summer. Students are encouraged to consider possible research groups as soon as the semester begins. This process involves attending faculty research presentations (CHEM 7010) and scheduling individual appointments with faculty of interest. In addition, new students often attend group meetings and are encouraged to talk with students who are in research groups of interest. Students are encouraged to explore these opportunities across multiple research groups as they work towards making an informed rank-ordered selection of which research advisors they would most like to work with by mid-November. Additional details are provided below:

1. Research Orientation Seminars

During the early part of the fall semester, an Orientation Seminar Series will be scheduled within CHEM 7010. At these seminars, faculty members available to assume the role of Research Advisor will present brief (30 minute) surveys of their on-going research programs. All entering students are required to attend this seminar series. It is the purpose of this series to expose new students to research opportunities available in the Chemistry Department. It is expected that students will use this introduction to research as a basis for the selection of several research groups for more in depth exploration.

2. Faculty Interviews

Each student will arrange more formal meetings with individual faculty members whose research activities appear attractive for thesis work. These meetings are opportunities to explore in greater depth the problems to be tackled and to gain a sense of the possible working relationship with a particular program and faculty member. Each student is required to meet with at least three faculty members, but there is no upper limit on the number of such discussions. A form towards the back of this Handbook is provided to document these faculty discussions.

3. Selection Process

After completion of the faculty interviews, students will indicate their first, second and third choices for research advisor on the Research Advisor Selection form. Because of space and support limitations, some first-choice selections may not be available. In that case, the Graduate Studies Committee, in consultation with faculty members and the student, will assign a second choice.

All students must return the completed selection form to the Graduate Studies Coordinator, Susie Marshall (Room 188), on or before November 15. For students beginning in January, the due date is April 15. The Graduate Studies Committee will

meet to review these selections for the entire class. No research advisor selections are final until the Graduate Studies Committee has approved them.

Except in cases of faculty overload or financial problems, the Graduate Studies Committee will approve the Student's first choice of research advisor. Should some complication arise, the Graduate Studies Committee will resolve it as rapidly as possible in full consultation with both the faculty and student involved. The Graduate Studies Committee will not assign a student to a research advisor other than his or her first choice or his or her alternate choice without full consultation with the student.

4. Selection of a Research Advisory Committee

After selection of a research advisor has been made, and before the summer of the first year, students are expected to assemble a three-member Research Advisory Committee. Prior to defense of the Ph.D. thesis, a fourth committee member must be selected from outside the department. This outside faculty member will receive a copy of the Ph.D. thesis and will be present at the Ph.D. thesis seminar and the oral examination.

B. Annual Review of Research Progress

At the end of each Spring semester, and until completion of the degree, each Ph.D. student beyond the second year in residence will file an annual report on research progress. The report should concisely summarize in two or three pages (single-spaced) the student's research accomplishments during the previous twelve months. Appended to the report should be a brief, typically one or two page, curriculum vitae (CV) listing the student's University Education (including anticipated Ph.D. thesis title and dissertation date), Teaching Activities, Academic Awards, Publications, and Presentations. The student's Research Advisory Committee will have the opportunity to review this information and recommend any action it deems appropriate to the Graduate Studies Committee. In cases where there is little or no progress, it may recommend that the candidacy of the student for the Ph.D. degree be revoked. The annual research report and CV must be submitted electronically as a single pdf file to the student's Research Advisory Committee and the Graduate Studies Coordinator within the time window May 15-31. The Graduate Studies Coordinator may administratively reject submissions containing an annual research report longer than three pages. A rejected submission must be rewritten to conform to the page limits.

In some cases, review of the annual report may require that the student meet with members of the Research Advisory Committee or with the Graduate Studies Committee. In other cases, no additional meetings may be necessary. In all instances, students whose performance is deemed unsatisfactory will be notified in writing by the Graduate Studies Committee. When financial circumstances allow, these annual report & CV submissions may serve as a basis for the competitive award of upper year fellowships.

C. Ph.D. Candidacy Examination

1. General Considerations

The examination consists of two nearly equal parts based on submitted written materials, oral presentations, and discussion with the student's Research Advisory Committee and other faculty. The first part is concerned with the candidate's thesis research, and the second part is based on the candidate's critique of an assigned journal article. Assessment of the oral components of the two parts of the examination will be made consecutively. Each part will begin with a ten-minute presentation followed by a twenty-five minute question and answer period. The questions will be related to, but not confined to, the topic of the presentation. There will be a ten-minute intermission between the first and second parts of the examination.

In part one of the examination, the student will provide an overview of his or her current research problem, including a testable hypothesis, the relationship of the project to related work of others, and a summary of progress to date. The presentation should include plans for future work and possible extensions, should the goals be achieved.

The written thesis research overview must be submitted to the Graduate Studies Coordinator two weeks before the start of the examination period. In a font size no smaller than ten point and no more than ten double-spaced pages in length (not counting a Reference List). The document will include an introduction, a summary of results to date, plans for future studies, and a statement of possible long-term implications. The format and style will be consistent with that used by major ACS journals in the candidate's field of study. The references should include article titles. Detailed experimental procedures, and other supporting information should be included in an appendix. Material in the appendix should be illustrative and supportive, but not essential to the overall understanding of the project. The report should be organized along the following lines with typical, but no mandatory, lengths provided:

1. Introduction (1-3 pages)
2. Progress to Date (6-7 pages)
3. Plans for Future Work (1-2 pages)
4. Appendix (experimental procedures, display of data, schematic drawings of equipment, and other supporting information)

In part two of the examination, the student will critique an assigned journal article related to his or her area of research. Approximately one month before the scheduled exam the student will be assigned a recent publication related to his or her major area of research. This assignment will be made by the research advisor in consultation with the chair of the student's Research Advisory Committee. After a thorough study of the assigned publication and relevant references, the student will prepare a summary and critique of the publication. Points to address are:

1. Purpose of the described research
2. Methods and techniques that were used

3. Conclusions of the authors
4. Critical evaluation of the approach used by the authors and their conclusions
5. Likely impact of the findings on future studies in the area of the research
6. Possible novel extensions of the findings

It is expected that critical statements that support or challenge the reported research will be supported by appropriate literature citations. The written summary and critique should be double-spaced and no more than five pages in length (not counting the reference list).

The oral presentation should provide an overview of the student's critique of the assigned paper in anticipation that the subsequent faculty question period can probe particular issues in greater depth.

2. Further Ph.D. Candidacy Exam Details

- a. All students who plan to take the candidacy examination will register for CHEM 7030. In this course, the instructor will work with students to assist in their preparation for the exam. Topics to be covered include the organization of the essential features of the progress report and the character of the oral examination question and answer session. Students will be asked to make oral presentations to the class on various topics within their chosen area and to write short summaries of published work.
- b. All students will electronically submit the thesis research overview component of the candidacy examination to the Graduate Studies Coordinator two weeks in advance of the *first day* of candidacy exams. The publication critique should be electronically submitted one week in advance of the *first day* of candidacy exams.
- c. The Research Advisory Committee will pose the first round of questions to the student. Subsequently, any faculty member present may ask questions.
- d. After all students have completed their candidacy exams, the faculty will meet to discuss student performances and recommend Ph.D. candidacy actions. Available to the assembled faculty will be student transcripts, research advisor assessments of student progress, and individual faculty assessments of both the written and oral components of the Ph.D. candidacy examinations. The overall faculty recommendations will be pass with distinction, pass, conditional pass, or fail.
- e. If the faculty recommends conditional pass, remedial action to be completed by April 15 will be outlined by the committee. The remedial work may take the form of a revised research summary or article critique or other actions, depending on the individual case. After completion of the remedial work, a final (pass/fail) decision will be made.
- f. Students who fail the candidacy examination will not be advanced to candidacy in the Ph.D. program but will be permitted to complete a master's degree. In such cases the student may:

1. terminate with an M.A. degree by May of that year[†] or,
 2. write and successfully defend an MS thesis by August of that year[‡].
- g. A student who selects the M.S. degree option may, with the permission of the research advisor, re-apply for admission to candidacy. In such cases a thesis defense and examination will be held following the oral presentation of the thesis results. This examination will take place with the Research Advisory Committee. If the thesis and defense are deemed acceptable by the Committee, and the student is judged to have passed the oral examination, admission to the Ph.D. program can be recommended.

D. Third Year Presentation

In the spring of the third year, students will present their research in a public forum. This format will be announced each year but will generally involve a poster session. A written one-page abstract will be electronically submitted to the Graduate Studies Coordinator one week before the presentation. These abstracts will be assembled in to a booklet for distribution prior to the session.

E. Ph.D. Completion Within 5 Years

By the end of the Spring semester of the fifth year in residence, students will complete their Ph.D. dissertation defense. If it is anticipated that the Ph.D. cannot be completed at the end of 5 years and additional financial support is desired, the student must supply an explanation for the delay, a timeline for completion and a CV to the Graduate Studies Direction along with a supporting letter from their advisor. Under some circumstances, additional time to complete the thesis and defense can be granted, but this must be approved by the Director of Graduate Studies and the Graduate School. The Graduate School of Arts and Sciences limits residency in any Ph.D. program to seven years.

F. Guidelines for Students Scheduling a Dissertation/Thesis Defense

1. The student will meet with his/her advisor to determine an appropriate defense date and to choose an outside faculty member to serve on his/her Doctoral Examining Committee (typically composed of the faculty advisor, the 3-member Research Advisory Committee plus one tenured or tenure-track UVa faculty expert from outside the Department). The Graduate School requires the Ph.D. examining committee, under the chair of the major advisory professor, **will consist of not fewer than four members from the graduate faculty**, one of whom must be from another department. The examining committee for the Master's degree should be conducted **by at least two faculty members designated by the department** in which the candidate is working.

[†] These deadlines will be strictly enforced. Extensions will be granted only under special circumstances by petition from the student and research advisor to the Graduate Studies Committee.

[‡] Note: In some research laboratories it may not be possible to undertake a research program that culminates in a M.S. degree. Students will be advised of this limitation during their first year prior to selection of a research advisor. Students selecting one of these research groups will not have the option of completing an M.S. thesis and must terminate their program with an M.A. degree.

2. At least two weeks prior to a scheduled defense the student will distribute one copy of the completed dissertation/thesis to each member of his or her examining committee.
3. During the ensuing two weeks, the committee will evaluate the scientific merit of the research and the format and style of the dissertation/thesis document.
4. Before the scheduled defense, the student will be informed if there are any major issues with the dissertation/thesis that prevents the defense from occurring. In this case, the student will be given instructions regarding the manner in which the issues are to be addressed. If no serious problems are identified, the defense will take place as scheduled. The committee might identify further changes to the thesis that are required prior to graduation.
5. Following a successful defense, including addressing any issues in the thesis, it will be the joint responsibility of the student and the research advisor to submit a final dissertation/thesis to the University that incorporates further committee recommendations. Approval of the M.S. or Ph.D. degree will only be given upon successful performance of these exercises.

G. Exit Requirements

Research students who leave the University following completion of degree requirements or for any other reason are responsible for proper cleanup of their working area. This includes benches, desks and fume hoods, where applicable. Research samples and notebooks should be properly labeled and stored and all chemicals that are no longer needed must be disposed of properly. Your research advisor should be consulted during this process. Prior to graduation each student and his/her advisor must sign the "Graduation Safety Release Form" (available towards the end of this Handbook) confirming adherence to these requirements. Finally, please complete the "Departure Form" (available towards the end of this Handbook) and an exit interview with Graduate Studies Coordinator, Susie Marshall.

H. University Degree Requirements

Department program requirements must be satisfied in addition to, but do not supersede, the University requirements for graduate degrees, as stated in the current [Graduate Record](#).

CHECK LIST FOR PREPARATION OF DEFENSE

1. See GSAS guidelines at: <http://graduate.as.virginia.edu/thesis-submission-and-graduation>
2. The following information is due in the Enrolled Student Office, 110 Randall Hall, on the following dates:

Graduate degree application – apply for Degree Application in SIS

September 30 for January graduation

January 31 for May graduation

June 30 for August graduation

Thesis title (submitted to Susie Marshall at sem8h@virginia.edu) in Word and pdf form

Doctoral students who are graduating in the fall term must submit the title of their dissertation with the final exam form

March 15 for May graduation

Doctoral students who are graduating in the summer term must submit the title of their dissertation with the final exam form.

Dissertation/Thesis

November 30 for January graduation

April 30 for May graduation

July 31 for August graduation

3. Consult with your research advisor for selection of a UVa faculty expert, outside of Chemistry, willing to serve with your advisor and sufficient members of your Research Advisory Committee to make up your Doctoral Examination Committee of at least 4 faculty.
4. Confirm a defense date with your advisor and your Doctoral Examination Committee members.
5. Reserve a room for your defense seminar and a room for your defense through Susie Marshall in Room 188.
6. Give a copy of your dissertation/thesis to each committee member at least two weeks before your defense date.
7. Announce your defense seminar to the Department by sending a copy of your abstract via e-mail to "chem-all" one week prior to your defense. Include in the e-mail the date, time and location of your seminar.
8. After your dissertation/thesis is in final form and accepted by your committee, have the Final Examination Form signed and bring to Susie Marshall in room 188. All other forms, including the Departure Form and Safety Release form, should be brought to Susie Marshall before you leave the Department
9. Upload Thesis to Digital Repository.
10. All copy charges for the dissertation/thesis are to be paid for by the student. Chemistry Department charge codes will not be used for expenses relating to the defense.

Twelve Steps to Graduation

Created in the Harman lab - (Transcribed and adapted by the GSC) -

Special Thanks to the Harman Lab!

Pre-Writing

1) Talk to your Advisor. When you get closer to graduating (*~1 year away*), talk to your advisor and figure out what you want to wrap up before you write up. Find **good stopping points** for your projects, and outline the experiments you want to complete before you leave the lab en route to the keyboard. Also, talk to your advisor about your **timeframe**. Let him/her know your preferred graduation date and think in a retroactively on how to get there. Make sure he/she agrees with you that your goals are attainable. **You always want your advisor's support before initiating your plan of attack.**

2) Give yourself a cushion. Writing a dissertation takes a long time. Even if you already have a lot of papers written and you are simply putting them together, the process drags on and on. Many small things come up along the way, such as imbedding figures into the text, checking references, scanning appendix material, numbering/renumbering all compounds/equations/figures including table of contents, etc. Furthermore if you want to graduate at an official university time (May, August, or January), remember that these times are when your final signed document is due. Before that time, you must give your thesis/dissertation to your advisor, then your committee 1-2 weeks before you defend, and then you have to make corrections. **Plan on having the completed document done at least a month before your target date for turning it in.**

3) Talk to Susie Marshall throughout the process. She will be your main contact as far as the many forms that need to be completed. She knows the system well and can help you with any changes that have been made over the years.

12 Steps

1) Register for classes. You must be registered for the term you wish to graduate. Contact Susie Marshall about how to register.

2) Apply for graduation is SIS - Follow the six steps to Graduation located on the Graduate School of Arts and Science website at: <http://graduate.as.virginia.edu/thesis-submission-and-graduation>

3) Submit the title of your thesis to Susie sem8h@virginia.edu as an attachment in Word and pdf form.

4) Clear your calendar (*~1 month before due*). Your **dissertation should be completely drafted** (it may still be rough- figures exist but not embedded). This draft can be given to your advisor to look over, but it is probably best to give your advisor a chapter at time.

Inform your committee of your intentions. Narrow your defense down to a week so they can check their schedules and get back to you on whether or not they will be in town. To be safe, *your defense week should be at least one week before the graduate school deadline* (more time is better). Also, you need to find **and out-of-department member to serve on your committee**. Your advisor will give you some suggestions.

5) Finish your thesis/dissertation so that you can hand it in to your committee 2 weeks before your defense. You will need **to talk to Susie about reserving a room**. You need one hour in a classroom like 304 and then at least 2 hours in a conference room. Let Susie give you an unofficial list of open rooms

during your designated defense week, then get back to your committee and try to find a good time for everyone.

6) Confirm defense time with committee, and tell Susie so she can **confirm it with Carruthers Hall**. She will send you a confirmation. Be prepared to pay for the copying costs for the five copies to be submitted to your committee members. Pick up an equivalent amount of three ring binders from the stockroom. Pick up your copies, place them in the notebook, and deliver them to your advisor and your four other committee members. Keep the original for yourself. Note: some committee members might accept an electronic version, but this should be verified and not assumed.

Noteworthy here is the condition of your document. It should be in final draft form with all the references, page numbers, compound numbers, figure number, figure embedding, table of contents, etc.

7) Prepare for defense. If you have turned in your thesis/dissertation *two weeks* before your defense, you now have *two weeks*. Hopefully, that is enough time, since most of your figures are already made, but if you are slow, plan accordingly.

8) Announce your defense *before you defend* by sending e-mail to 'chem-all@virginia.edu' which tells everyone when and where you will be defending. Also, you should attach a copy of your abstract.

9) After your defense seminar, you go to your actual defense. This is the question and answer period with your committee. After you finish, you can get your Final Examination form signed and then you won't have to worry about tracking down your committee again.

10) Make the corrections suggested by your committee. Also, you will need to go back and make sure your figures are, when possible, on single pages with their captions on the same page. Unfortunately, this usually means you have to renumber pages and then table of contents. This process is tedious. Make sure you have added any necessary crystal structures and NMR spectra. Also, make sure your margins are correct and that your abstract is the appropriate number of words. After making your final corrections, take it up to the print shop and get two copies for yourself and for your group as needed.

11) Get forms signed. The Final Examination form states you passed the defense exam and has a place to write down the names of your committee. Fill it out and have your advisor and the department Chair sign it. Then take the form to Susie and she will complete the final milestone in SIS for you and submit the form to the GSAS office. Furthermore, you will need to get a **Safety Release Form (from Susie)** signed by your advisor, as well as a **Departure Form** (from Susie) if you are leaving the University. The **Survey of Earned Doctorates** will need to be submitted online. You must also **Upload Thesis to Digital Repository**. Doctoral and master's students whose degree requires the submission of a thesis must upload the final, approved version of the thesis to the University Library's digital repository, also known as LIBRA.

CHECK LIST FOR THESIS/DISSERTATION SUBMISSION

Up to date information on completion and submission of thesis/dissertation can be found at:

<https://graduate.as.virginia.edu/thesis-submission-and-graduation>

You are encouraged to visit and familiarize yourself with requirements and process well in advance of your defense.

The following forms must be completed and ready to submit prior to GSAS's inspection of the Ph.D. dissertation; otherwise, the dissertation will not be accepted:

[Final Examination Form](#) (if department has not already submitted it to GSAS)

Survey of Earned Document Form (only for Ph..D. degree candidates)

Upload Thesis to Digital Repository - Doctoral and master's students whose degree requires the submission of a thesis must [upload](#) the final, approved version of the thesis to the University Library's digital repository, also known as LIBRA.

The following form must be submitted when you submit your **master's thesis** unless your department has already submitted the form to GSAS:

[Final Examination Form](#) (if department has not already submitted it to GSAS)

Upload Thesis to Digital Repository - Doctoral and master's students whose degree requires the submission of a thesis must [upload](#) the final, approved version of the thesis to the University Library's digital repository, also known as LIBRA.

Suggested Page Order:

DISSERTATIONS

Title Page
Copyright Page (if applicable)
Abstract
Signature Page (if not on the title page)
Dedication Page (optional)
Body of Text

THESIS

Title Page
Abstract of introduction (if applicable)
Signature Page (if not on title page)
Dedication Page (optional)
Body of Text

DIGITAL FORMAT

Documents are **ONLY** accepted in PDF format (include all fonts, no compression or password protection). The title page, copyright page (if applicable), abstract, signature page (if not on title page) dedication page (optional) and body of text **MUST** be combined into **ONE** pdf file. The file **MUST** be saved as the student's last name then first name.

Below is a screen shot of the steps in the process (from the Graduate School website listed above):

 me2

Doctoral Degree

- Step One: Degree Application in SIS
- Step Two: Verify Requirements and UVa Transcripts
- Step Three: Dissertation Title
- Step Four: Final Examination Form
- Step Five: Survey of Earned Doctorates
- Step Six: Upload Thesis to Digital Repository

En Route Master's Degree for Doctoral Students

- Step One: Submit Master's Degree Request Form
- Step Two: Verify Requirements
- Step Three: Final Examination Form
- Step Four: Upload Thesis to Digital Repository

Terminal Master's Degree Students

- Step One: Degree Application in SIS
- Step Two: Verify Requirements and UVa Transcripts
- Step Three: Final Examination Form
- Step Four: Upload Thesis to Digital Repository

FACULTY	RESEARCH AREA	ROOM	PHONE
Ai, Huiwang, Associate Professor (ha8m)	Organic/Biological/Analytical	Pinn Hall 4020	4-5665
Bazydlo, Lindsay, Assistant Professor (lal2s)	Pathology	Old Med Sch.	4-2473
Bushweller, John, Professor (jhb4v)	Physical/Biological	Jordan 4233	3-6409
Cafiso, David S., Alfred Burger Professor (dsc0b)	Physical/Biological	188A	4-3067
Cleeves, Ilsa, Assistant Professor (lic3f)	Physical/Astronomy	Astr. 215	3-5567
Columbus, Linda, Associate Professor (lc4zs)	Physical/Biological	PLSB 106	3-2123
DuBay, Kateri, Assistant Professor (khd2t)	Physical/Biological	388C	3-2159
Egorov, Sergei, Professor (sae6z)	Physical	267	4-7690
Fraser, Cassandra L., Professor (cf4n)	Inorganic/Organic/Biological	286	4-7998
Gahlmann, Andreas, Assistant Professor (ag5vu)	Physical/Biological/Analytical	133	4-3624
Garrod, Rob, Assistant Professor (rg5qp)	Physical	161	4-0773
Gilliard, Robert, Assistant Professor (rjg8s)	Organic/Inorganic	229	297-7975
Grisham, Charles M., Professor & Assoc. Chair (cmg)	Physical/Biological	465	4-7012
Gunnoe, Brent, Professor (tbg7h)	Inorganic/Organic	239	2-2692
Harman, W. Dean, Professor and Department Chair (wdh5z)	Inorganic/Organic	288B	3-3060
Harrison, A. Ian, Professor (ah8t)	Physical/ Analytical/Inorganic	127	4-3639
Herbst, Eric, Commonwealth Professor (eh2ef)	Physical	166	3-0535
Hilinski, Michael, Assistant Professor (mh6cu)	Organic	288C	4-0159
Hsu, Ku-Lung "Ken", Assistant Professor (kh4ch)	Organic/Biological/ Analytical	388A	297-4864
Hunt, Donald F., University Professor (dfh)	Organic/Biological/ Analytical	188B	3-3610
Landers, James P., Commonwealth Professor (jpl5e)	Biological/ Analytical	388B	3-8658
Lazo, John, Professor (jsl8f)	Biological	MR4-4072C	3-1936
Lehmann, Kevin, William R. Kenan Jr. Professor (kl6c)	Physical/ Analytical	125	3-2130
Machan, Charlie, Assistant Professor (cwm5b)	Inorganic/Physical	288A	4-7997
Morkowchuk, Lisa, Lecturer (lnm2a)		369	4-0924
Pate, Brooks H., William R. Kenan Jr. Professor (bp2k)	Physical	131	3-0384
Pompano, Rebecca, Assistant Professor (rrp2z)	Analytical/ Physical	PLSB 110	2-1825
Pu, Lin, Professor (lp6n)	Inorganic/Organic	265	4-6953
Serbulea, Laura, Lecturer (lls3s)	Organic	360	4-0924
Stains, Cliff, Associate Professor (cs3dh)	Chemical Biology	167	
Stains, Marilyne, Associate Professor (ms2sx)	Chemical Education	PLSB 116	
Swami, Nathan, Professor (ns5h)	Inorganic/Physical/ Analytical	Thornton C218	4-1390
Venton, Jill, Professor (bjv2n)	Analytical/ Physical	PLSB 108	3-2132
Welch, Kevin, Lecturer (kdw9e)	Organic	361	4-6316
Wheeler, Lindsay, Lecturer (lsb4u)		Hotel D	2-2816
Zhang, Sen, Assistant Professor (sz3t)	Inorganic/Physical/ Analytical	188C	4-1494

STAFF	ROOM	PHONE
Arrington, Charles, Organic Lab & Research Tech (cka7e)	450A	4-3717
Ashcraft, Earl, Instrument Tech	275C	4-7373
Bai, Dina, Information Tech. Specialist (Hunt Lab) (dlb6z)	170	4-3249
Beamer, Victoria, Reimbursement & Travel Specialist (vlb2d)	465	4-3158
Birckhead, Michael, Inventory Line Lead (mwb6e)	Gil B098	4-1421
Cropley, Cecelia, Scientific Program Administrator (cc2gg)	465	4-3704
Dean-Clemmer, Jan, Gen. Chem. Lab. & Res Tech (jyd)	360	4-4716
DeBary, Ed, Infracture Manager	465	4-3157
Dickie, Diane, Senior Scientist	MSE 103	4-9652
Ellena, Jeff, Senior Scientist –School of Medicine (jfe)	162	4-3163
Feggans, Vivian-Administrative Coordinator	288	2-5485
Ham, Hueng Sik-Lab Specialist I (hh2za)	179	7-4905
Knight, Cindy, Undergraduate Programs Coordinator (csk3a)	468	4-7995
Marshall, Susan, Graduate Programs Coordinator (sem8h)	188	4-7014
Matula, Seth, Business Administrator	465	
Price, Carol, Biochem Instructional Lab Support Specialist (caw2n)	PLSB 120	4-7880
Reiner, Jarred, Information Technologist (jmr6j)	163	4-3077
Scott, Debbie, Purchasing Specialist (dls9r)	GIL B098	2-2104
Shabanowitz, Jeff, Principal Scientist (Hunt Lab) (js4c)	180C	4-7994
Shifflett, Jerry, Service Technician (jas5qc)	195	4-3649
Spence, Caleb, Temp/Renovations	195	
Via, Danny , Storeroom Manager (dwv8f)	GIL B098	4-6838
SERVICES		
Building Maintenance	5 th Floor	4-3618
Faculty/Staff Mailroom	PLSB 101	
Janitorial Service	322	3-2572
Mass Spec Lab	157	4-7723
NMR Lab	105,106	4-3163 4-4623

RESEARCH ADVISOR SELECTION

TO: Graduate Studies Committee (c/o Susie Marshall)

FROM: _____

RE: Research Advisor Selection

DATE: _____

I have interviewed the following 3 or more faculty about the research opportunities in their group:

Faculty Signature
(Required)

- | | |
|----------|-------|
| 1. _____ | _____ |
| 2. _____ | _____ |
| 3. _____ | _____ |
| 4. _____ | _____ |
| 5. _____ | _____ |

I have selected the following faculty in order of preference:

1. _____
2. _____
3. _____

Signed (Student): _____

RESEARCH ADVISORY COMMITTEE SELECTION

TO: Graduate Studies Committee (c/o Susie Marshall)

FROM: _____

RE: Research Advisory Committee

DATE: _____

After consulting with my research advisor, Dr. _____, I have chosen the faculty listed below as members for my committee:

	NAME	FACULTY	SIGNATURE
Chair:	_____	_____	_____
Member 1:	_____	_____	_____
Member 2:	_____	_____	_____

SIGNED (STUDENT): _____

APPROVED (RESEARCH ADVISOR): _____

GRADUATION SAFETY RELEASE FORM

Prior to graduation, each student must verify and sign this form to release official graduation materials. Official graduation will be delayed until you do so.

I verify that I have cleaned the laboratory space that I have used.

I have properly disposed of all chemicals, solvents, and research materials.

I have labeled all research products accurately and stored them properly in authorized chemical storage facilities.

Degree Candidate

Date

Advisor

Date

Please complete the Departure form on the next page before you leave the Department and give it to Susie Marshall in Rm. #188. She will schedule an exit interview with you about your experience in the Department. We welcome any suggestions as to how we may improve the graduate experience in Chemistry. Your name will remain anonymous in the summary reporting of oral exit interviews that will be made periodically to the Graduate Studies Committee.

DEPARTURE FORM

NAME: _____ **ARRIVAL/DEPARTURE DATES:** _____

POSTDOCTORAL____ **STUDENT**____ **GRADUATION DATE:**_____

UVA DEGREE: None____ **M.A.**____ **M.S.**____ **Ph.D.**____

RESEARCH ADVISOR:_____

TITLE OF NEW POSITION:_____

NEW BUSINESS ADDRESS:_____

(include company name)

PHONE NUMBER(S):_____

EFFECTIVE DATE:_____

NEW HOME ADDRESS:_____

HOME PHONE NUMBER(S):_____

NEW/NON-UVA EMAIL ADDRESS:_____

WEBSITE/FACEBOOK ADDRESS?: _____

COMMENTS:_____

(Please continue comments on reverse and additional pages as necessary)

**PLEASE RETURN COMPLETED FORM TO SUSIE MARSHALL IN ROOM 188 AND
SCHEDULE AN EXIT INTERVIEW WITH HER**

UNIVERSITY OF VIRGINIA RESEARCH ETHICS POLICY AND PROCEDURES

I. Introduction

The University of Virginia has two committees assigned responsibility for investigating of alleged misconduct. Investigation of suspected research misconduct in the School of Medicine will be conducted by a permanent Research Ethics Committee of the School of Medicine. The School of Medicine Research Ethics Committee serves at the request of the Dean of the School of Medicine as a permanent advisory committee. In addition to its investigatory responsibilities, it may from time to time, as it or the dean sees fit, issue statements or guidelines about research practices in the School of Medicine. Its membership includes the Assistant Provost for Research. The University Research Ethics Committee serves at the request of the Provost. Its purpose is to investigate allegations of misconduct committed during the conduct of University research by anyone other than a member of the School of Medicine. Research misconduct is defined as actions which cast doubt on the integrity of research and research results, such as (1) invention of data, (2) falsification of existing data, or (3) presentation as one's own of data obtained by another without the latter's permission. This definition and the following procedure also apply to investigations by the Research Ethics Committee of the School of Medicine.

The procedure described in this document is an investigation process, not a hearing. The role of the Committee under this procedure is to investigate, so it may recommend action to the appropriate Vice President or Dean. If the appropriate senior academic official decides to take disciplinary action against a research investigator, he or she may use any regular grievance procedure which applies in the particular case. Due process hearing will be provided in the course of such a grievance procedure.

II. Request to Investigate

The Committee will investigate suspected research misconduct at the request of the Associate Provost for Research or the Dean of the School of Medicine. Any person inside or outside the University may request the Associate Provost for Research or the Dean to assign the Committee to an investigation. The Dean of the School of Medicine will inform the Associate Provost for Research and the Vice president for Health Sciences of any request to investigate suspected research misconduct. The Associate Provost for research will notify the appropriate academic Vice President of any impending investigation.

III. Investigation Procedure

Each Committee's goal in investigating suspected research misconduct is to obtain as much accurate and relevant information as the Committee needs to make a recommendation to the appropriate senior academic official, and to obtain such information in as prompt, efficient and non-disruptive manner as possible. Methods of achieving this goal will vary with the circumstances of each case. The following procedures are, therefore, only a preliminary and general guide to the Committees. The Committees may vary the procedure as it chooses for any particular case.

1. After reviewing any written request from the Associate Provost for Research or the Dean for an investigation, and any accompanying written materials, the appropriate Committee will meet to discuss and obtain any additional information available.

2. The Committee will next meet with the person who alleged the misconduct (hereafter referred to as "complainant") to determine the specific nature of the suspected research misconduct and to obtain all information (including documents and names of witnesses, expert or otherwise) which the complainant believes relevant to the Committee's investigation.

3. The Committee chair will arrange for a secretary to attend each Committee meeting to take notes concerning the information provided to the Committee. The chair will periodically prepare written descriptions of the information gathered by the Committee, which will be subject to correction by Committee members.

4. After meeting with the complainant, the Committee chair and one other Committee member will meet with the person accused of research misconduct (hereafter referred to as “respondent”). The respondent can be represented by legal counsel if he or she wishes to do so. The chair will provide the respondent with a brief written description of the specific nature of the suspected misconduct, but will not reveal the identity of the complainant unless the complainant has consented in advance. The chair will provide the respondent with a copy of the evidence submitted by the complainant and will inform the respondent of any significant changes in procedures which the Committee has decided to use in the case at hand. The chair will ask the respondent to provide the Committee with any written statement he or she wishes to make, and a list of all documents and witnesses which the respondent believes are relevant to the Committee’s investigation. The chair will notify the respondent of the date, time and place of the Committee’s meeting, which the respondent is invited to attend.

5. After meeting with the complainant and the respondent, the Committee will obtain and review such documents as it decides it should review at that point. It will then meet with the respondent to obtain information relative to the evidence submitted by the complainant. The respondent may be accompanied by his or her legal counsel, but such counsel will not be allowed to participate in the meeting, other than to advise the respondent.

6. After meeting with the respondent, the Committee will decide the number and order of any additional witnesses with whom it wishes to meet. As it progresses in its meetings with witnesses, the Committee will continue to review any additional relevant documents and may at any time request additional meetings with the complainant, the respondent, or other witnesses as the Committee determines appropriate.

7. If at any point during its investigation, the Committee determines insufficient cause exists, the Committee may end its investigation and report its finding to the appropriate senior academic official. Similarly, if at any point during its investigation the Committee determines it has already obtained sufficient information to recommend action by the appropriate senior academic official, it will end its investigation and report its findings.

8. The respondent will not be present at any of the meetings of the Committee with other witnesses except as the Committee may otherwise decide. If the respondent is allowed to attend any such meeting, the respondent and his or her counsel will not be allowed to ask the witness any questions directly but may inform the Committee of the types of questions which the respondent requests the Committee to ask the witness.

9. Except as otherwise specifically provided in this procedure or as required by law or regulation, all records of the Committee's proceedings will be kept confidential and not revealed to the complainant, the respondent or others. Similarly participants in the proceedings are required to treat any information, statements, or conclusions as strictly confidential.

10. The Office of the University's General Counsel will provide consultation and advice to the Committee, and the General Counsel or designee may attend any of the meetings of the Committee to provide advice and assistance.

11. After completing its investigation, the Committee will provide the appropriate senior academic official with its written report which will be organized into two sections, the first of which will state the factual findings made by the Committee and the second of which will state the recommendation of the Committee concerning what, if any, action should be taken by the appropriate senior academic official.

12. The Committee report may be transmitted to any Federal, State or private sponsor of research should misconduct in research be found. Similar communications may also take place with the editors of professional journals where the research results have appeared.

The retention of accurately recorded and retrievable results is of the utmost importance in the conduct of research and it is the responsibility of each investigator. The following is the University policy on the recording and storage of laboratory data:

Data and notebooks resulting from sponsored research are the property of the University of Virginia. It is the responsibility of the principal investigator to retain all raw data (in laboratory notebooks or other appropriate format) for at least five years after completion of the research (i.e., publication of a paper describing the work, or termination of the supporting research grant, whichever comes first) unless required to be retained longer by contract, law, regulation or by some reasonable continuing need to refer to them. If the principal investigator leaves the University of Virginia, he or she may transfer such data to another institution, provided that the Vice Provost for Research approves and provided that the University is given written assurance that the data will be retained for the required five-year minimum retention period.