

Virginia Commonwealth University
Department of Chemistry



VCU

2023-2024
Graduate Studies Handbook

DEPARTMENT OF CHEMISTRY
BOX 842006
RICHMOND, VA 23284
PHONE: 804-828-1298
FAX: 804-828-8599

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Dear Graduate Students:

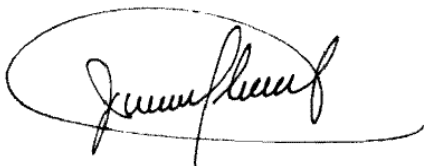
Welcome to the graduate program of the Chemistry Department at Virginia Commonwealth University. I am confident you will discover that the education you will obtain at VCU will prepare you for your professional career. I am also positive you will find the Department an enjoyable place to work and study.

This handbook is intended to serve as a general resource for policies, requirements, and procedures of the graduate programs offered by the Department. Graduate Students should also refer to the Graduate School Bulletin, which documents the official rules and regulations for graduate education at the university (<http://bulletin.vcu.edu/academic-regs/grad/>). The handbook also contains information regarding the structure of the Department, its personnel, and their job responsibilities.

I hope you find this information useful as you prepare to enter the program or while you are a student in the Department. If you have any questions, please feel free to contact me.

Once again, welcome to the Department of Chemistry and VCU.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Julio Alvarez", enclosed within a large, horizontal oval shape.

Julio C. Alvarez
Graduate Program Director

Chemistry Directory

Chair: Maryanne M. Collinson

Associate Chair: Suzanne Ruder

<i>Name</i>	<i>Phone</i>	<i>Office</i>	<i>Bldg</i>	<i>Email</i>
PRINCIPAL INVESTIGATOR FACULTY				
ALVAREZ, Julio	(804)316-5094	4025	OLVPH	jcalvarez2@vcu.edu
ARACHCHIGE, Indika	8-6855	4024	OLVPH	iuarachchige@vcu.edu
BELECKI, Katherine		2044	OLVPH	kbelecki@vcu.edu
BRATKO, Dusan		4021	OLVPH	dbratko@vcu.edu
CARPENTER, Everett		3309 C	TEMPL	ecarpenter2@vcu.edu
COLLINSON, Maryanne	8-2753 (804)220-1570	4429	TEMPL	mmcollinson@vcu.edu
CROPP, Ashton		3047	OLVPH	tacropp@vcu.edu
DHAKAL, Soma	804-461-3131	4423	TEMPL	sndhakal@vcu.edu
EL-KADERI, Hani		4019	OLVPH	helkaderi@vcu.edu
EL-SHALL, Samy	8-3518	4026	OLVPH	mselshal@vcu.edu
FUGLESTAD, Brian	(804)495-1011	3045	OLVPH	fuglestadb@vcu.edu
GOMES, Fabio		4022A	OLVPH	pereiragomf@vcu.edu
HARTMAN, Matthew	(804)554-2549 628-4095	3048	OLVPH MCV	mchartman@vcu.edu
HUNNICUTT, Sally		3035	OLVPH	sshunnic@vcu.edu
LAO, Ka Un	8-3071	3046	OLVPH	laoku@vcu.edu
LUCAS, Heather	8-7512	4022	OLVPH	hrlucas@vcu.edu
RUDER, Suzanne		4023-A	OLVPH	sruder@vcu.edu
SIDOROV, Vladimir		4023	OLVPH	vasidorov@vcu.edu
SIEBER, Joshua		3037	OLVPH	jdsieber@vcu.edu
TIBBETTS, Katharine	(804)404-8705	4020	OLVPH	kmtibbetts@vcu.edu
WANG, Xuewei	(804)821-1990	3309-B	TEMPL	wangx11@vcu.edu
UNDERGRADUATE INSTRUCTION FACULTY				
BAKER, Jon	8-2276	2063	OLVPH	jcbaker@vcu.edu
CRAWFORD, Michael				crawfordml2@vcu.edu
GILES, Robert		2072	OLVPH	rlgiles@vcu.edu
HARRIS, Amanda	(804)496-1760	2048	OLVPH	harrisal@vcu.edu
HOLLE, Maxwell				hollemj@vcu.edu
KUKLINSKI, Nick		2046	OLVPH	kuklinskinj@vcu.edu
MOUSSA, Sherif		2049	OLVPH	smoussa@vcu.edu
ROESSER, James		2064	OLVPH	jroesser@vcu.edu

SMITH, Mychal	(804)234-3121	2074	OLVPH	mdsmith@vcu.edu
COORDINATORS AND FACILITY DIRECTORS				
CRAWLEY, Charlene Coordinator for Interdisciplinary Science and Emerging Scholars				cdcrawle@vcu.edu
FRANKLIN, Constance Organic Lab Coordinator		4 th floor	STEM	franklinc@vcu.edu
POLO, Deborah Director of Student Learning Outcomes		2065	OLVPH	dlpolo@vcu.edu
QU, Yun Director NMR Facility	(804)655-0998	3307	TEMPL	yqu@vcu.edu
LALLY, David Undergraduate Advisor		2070	OLVPH	lallydj@vcu.edu
TURNER, Joseph Director Instrumentation Facility	8-5377	3015	GEHHS	jturner9@vcu.edu
WALLER, LaChelle Director Undergraduate Advising	8-5946	2069	OLVPH	lmwaller@vcu.edu
STAFF				
ALLIN, Edith Fiscal Service Center Manager	8-0216	2054	OLVPH	emallin@vcu.edu
ARNOLD, John Building Manager	(804)420-8087	3014	GEHHS	jjarnold@vcu.edu
FISH, Jason Undergraduate Administrative Assistant	8-6660	3041	OLVPH	fishj@vcu.edu
MILLER, Rhea Graduate Administrative Assistant	7-0352	3039	OLVPH	rmiller3@vcu.edu
MORRIS, Michael (Stockroom)	8-7501	3054	OLVPH	mpmorris@vcu.edu
DEPARTMENTAL ADMINISTRATIVE OFFICES AND RESOURCES				
CHEMISTRY Office (Main)	8-1298 8-8599 (FAX)	3041	OLVPH	chemistry@vcu.edu
MAILROOM/COPIER Office	NO PHONE	3053	OLVPH	NONE
FISCAL Office Copier Room	7-0248 (FAX)	2050	OLVPH	NONE
STOCKROOM	8-7501	3054	OLVPH	NONE
COMPUTER LAB	NO PHONE	3303	TEMPL	NONE
GSO (Grad Student Organization)	NO PHONE	3309 A&B	TEMPL	President: Abdullah Macktuf (mactufma@vcu.edu)
Humanities & Sciences Tech (HASTECH)	8-6180			hastech@vcu.edu
Media Support Services	8-1098		Cabell Library	NONE

Who Does What in the Department: A Quick Overview

Chair, Dr. Maryanne Collinson

Manages Faculty and Staff
Fiscal Matters
New Initiatives
Addresses concerns from faculty, staff, and students as needed

Associate Chair, Dr. Suzanne Ruder

Manages undergraduate teaching related tasks
Handles TA assignments
Manages TA concerns

Graduate Admissions and Recruitment Director, Dr. Indika Archchiage

Corresponds with prospective graduate students
Handles graduate student admissions

Graduate Director, Dr. Julio Alvarez

Oversees academic compliance of chemistry graduate students
Handles graduate student orientation and proficiency exams
Manages graduate student concerns and write letters of degree progress and completion
Conducts annual assessment of chemistry MS and PhD degrees

Assistant to Departmental Administration, Jason Fish

- Undergraduate student matters: change of grades
- Course scheduling
- Coordinates student hourly staff
- Faculty searches
- Some events

Administrative Assistant, Rhea Miller

- Graduate student forms
- Seminar and most department events
- Keys
- Copy machine and poster printing
- RealSource ordering

Chemical Safety and Operations Manager, John Arnold

- “Whatever is needed to make chemistry function”
- Chemical safety questions
- Back up for Dr. Turner in instrument lab, as needed
- Helpful resource to graduate students

Stockroom Manager (Michael Morris)

- Shipping & Receiving
- Teaching Labs – Supplies and prep and Safety
- Web master for VCU chemistry
- Social Media: Twitter

Chemistry Service Center Manager, Edith Allin

- Fiscal Management for the Department
- Ultimate responsibility for all chemistry financial accounts
- Grant and Start up accounting and compliance
- Financial Management and reconciliation of departmental accounts
- Stockroom, NMR, and Instrumentation external billing

Finance Tech, Humanities and Sciences: Katie Hewitson

- Travel and Personal Reimbursements
- generic email for travel: chemtravel@vcu.edu
- generic email for orders not through Realsource: chemfororder@vcu.edu

Human Resource Coordinator, Humanities and Sciences: Donna Ruff

- Personnel – Hiring of non-benefitted staff - postdocs, hourly and student workers
- Timekeeping and leave
- Visas
- Department Reports

Graduate Program

This handbook is a guideline of Department's policies, procedures and graduate rules under the umbrella of the College of Humanities and Sciences and the Graduate School at VCU. If you have any questions, please check with the Graduate Director.

1. General Information

The Chemistry Department has compiled this handbook to aid applicants and graduate students in understanding the policy for M.S. and Ph.D. degrees. This document is located at <https://chemistry.vcu.edu/graduates/graduate-handbook/>. Students are responsible for reviewing academic regulations described in the Graduate Bulletin at <http://bulletin.vcu.edu/academic-regs/grad/>. Questions should be addressed to the Chair and/or Graduate Director, Department of Chemistry, P.O. Box 842006, Virginia Commonwealth University, Richmond, Virginia 23284-2006, (804) 828-1298. Students are required to understand the policies of the university. Academic misconduct, discrimination, and/or harassment of any type will not be tolerated.

A. Degrees, Programs and Concentrations

Virginia Commonwealth University offers programs leading to the Doctor of Philosophy (PhD) and Master of Science (MS) degrees in Chemistry (CHEM), as well as PhD in Chemical Biology (CHEB) and Nanoscience (NANO). In cooperation with the Physics Department, VCU also offers a PhD degree in Chemical Physics (CHEM PHYS). The degree of MS is offered in thesis and non-thesis tracks, while the part time option for PhD in Chemistry is also available if the applicant receives endorsement from a research advisor within the department. Students interested in these options are encouraged to contact potential research advisors prior to enrollment and secure funding as VCU does not offer financial aid for MS or part-time PhD students. Requirements and general policy Information for each graduate degree offered including concentrations can be found at: <http://bulletin.vcu.edu/graduate/college-humanities-sciences/chemistry/>

B. Financial Assistance: GTA, GRA, etc.

Students on the PhD track are eligible for financial assistance from VCU through graduate teaching or research assistantships (GTA or GRA), however funding from self or fellowships outside VCU is also acceptable. GTA and GRA positions include tuition waiver but not necessarily a waiver of fees. A typical GTA or GRA contract covers two semesters (Fall and Spring; 9-month), though a one semester contract (4.5-month) is also possible. Assistantship contracts (GTA or GRA) starting on August 10th or January 10th, respectively. The contract for summer semester is offered separately.

Summer support may be available through GRA (from advisor's grant) or GTA when teaching during summer. This latter entails a reduced teaching load with a correspondingly lower stipend than a regular semester GTA. The rules for awarding financial support in the form of GTA, providing good standing and progress in the program, are as follows:

- A student who enters the PhD program with a bachelor's degree may anticipate support up to **FIVE CALENDAR YEARS**.
- A student who enters the PhD program with a master's degree may anticipate support up to **FOUR CALENDAR YEARS**.

Academic calendars including important landmarks for every academic semester can be found at: <https://academiccalendars.vcu.edu/>

To qualify for financial support, students **may not hold employment outside VCU** and must maintain a graduate GPA ≥ 3 (B, without rounding up) making timely progress while registering 9-15 graduate credits per semester. GRAs are allowed to register 1 credit of dissertation credits per semester but only upon becoming PhD candidates in the 4th semester and with approval from research advisor. **Financial aid ceases when a PhD Student transfers to MS.** (Graduate Bulletin <http://bulletin.vcu.edu/academic-regs/grad/>)

GTA support is provided by the department and may be renewed each year for **up to 5 years**. Students with GTA contract are assigned to teach laboratory sections, lead discussions for large lecture classes, grade laboratory or lecture classes, and other teaching/research support duties, depending on the department needs. These assignments are made by the Associate Chair prior to the start of each semester and can vary. When unable to fulfill assigned duties (grading, teaching, etc.) students appointed as GTAs must arrange in advance for a replacement with another GTA. In case of emergency, the GTA must notify immediately the Associate Chair and the Professor in charge of the course to find a replacement, however the student is expected to reciprocate in kind in a future assignment. When asking a GRA to fill in for a GTA teaching a lab, the student must request permission from the corresponding advisor. Graduate students serving in GTA positions are important members of the academic community in the Chemistry Department. As such, GTAs are expected to follow the VCU code of conduct (<https://president.vcu.edu/policies/>) and follow relevant policies and procedures set forth by the university (<https://vcu.public.doctract.com/>). VCU is committed to providing an environment free from sexual misconduct, assault, harassment or any sex/gender discrimination that may violate Title IX of the Education Amendments of 1972 and other state and federal laws (<https://equity.vcu.edu/title-ix/policies/>)

GRAs perform research for advisor faculty members who are Principal Investigators (PIs) pursuing funded research programs. Students with a GRA contract are expected to work in the faculty's laboratory to conduct research as defined by the faculty advisor. The renewal of GRA contract is based on the availability of the faculty's research funding and the students' performance as evaluated by the faculty advisor. Often, GTAs become GRAs after attaining PhD candidacy (in the 4th semester) at discretion of the PI and the availability of research grants. The Department also offers a number of scholarships, which are awarded on a yearly basis and are listed in the departmental webpage including application requirements at: <https://chemistry.vcu.edu/undergraduates/departmental-scholarships/>. Students must apply through the Rams Scholarship Hub (typically) in the Spring semester.

C. Health Insurance for PhD Students

Created in response to student demand, the student health insurance program offers a comprehensive health insurance package for VCU students through United Health Care. All full-time PhD Students (registered for 9-15 graduate credits) must enroll in the program unless proof of other insurance is provided. The coverage period typically runs from August 15 to August 14 of the following year. The university subsidizes 70% of premium cost while the student is responsible for the other 30%. Once enrolled in, students are covered through the entire coverage period regardless of graduation halfway. There is no reimbursement if a student decides to cancel enrollment during mid-coverage period. Information about the program, plan benefits, enrollment/opting out, and frequently asked question can be found in the student health insurance program webpage:

<https://provost.vcu.edu/insurance/>

D. Tuition, University Fees, and Types of GTA-GRA Contracts

The financial aid package for PhD students includes a tuition waiver that covers tuition costs throughout the program duration but not more than 10 semesters and counting on timely progress with GPA ≥ 3 (B) (without rounding up). When students are supported as GTAs, the tuition waiver is paid by the College of Humanities and Sciences and students must register 9-15 graduate credits per semester during pre-candidacy (first 4 semesters). After passing the Oral Candidacy Exam in the 4th semester and having applied for candidacy with the dean's office, GTAs are required to register 9 credits HUMS 701 (full-time) and enroll in the health insurance program (see above). When students are supported as GRAs during post-candidacy (after the 4th semester), the tuition waiver is paid by Advisor's grant and students have two options for registration: one is 9-credits of HUMS 701 requiring enrollment in the health insurance program, and the other is 1 credit of CHEM 697 **without access to health insurance** but reduced fees (see below). During post-candidacy, GTAs must always register HUMS 701 because enrollment in any other course will generate a bill sent to the student. Likewise, GRAs in post-candidacy must register HUMS 701 or 1 credit of CHEM 697 (nothing else), to prevent charges billed to the student.

University fees are charged to students on a semester basis, but their price reduces ~90% when switching registration of 9-15 credits (full-time) to 1 credit. Therefore, PhD candidates (after the 4th semester) who are also GRAs (not GTAs) and wish to minimize costs in university fees are allowed to register 1 credit of CHEM 697. However, these GRAs are responsible for their own health insurance, and this option must be approved by student's advisor and communicated promptly to the financial manager in the department. To prevent payroll delays students and advisors are encouraged to plan ahead and inform the financial manager of the GRA contract they desire. The department offers three types of contracts for PhD students on tuition waiver: full-time (9-15 credits) for GTAs in pre-candidacy, full-time (9 credits HUMS 701) for GTAs and GRAs in post-candidacy, and non-full-time (1 credit CHEM 697) GRAs in post-candidacy. These contracts are different because the tuition costs and fees for each one, may be also different.

International students in GRA who choose 1 credit during post-candidacy, are required to request a "full-time equivalent" (FTE) form at <https://global.vcu.edu/students/immigration/f1studentcourses/> from the VCU Global Education Office (GEO). Both student and advisor must fill out and sign the form adding a letter of advisor support to the request (instructions on what to write in the letter are described in the form). The form must be emailed to the Global Education Office allowing a week for processing. Once the request is approved, the student can register CHEM 697. Students on visa who are on GRA contract must do this procedure every semester they choose to register 1 credit of CHEM 697. Domestic GRAs choosing 1 credit of CHEM 697 in post-candidacy are not required to do the FTE-step but they are responsible for their own health insurance.

E. Proficiency Examinations for CHEM and CHEM PHYS Students

Students entering the CHEM graduate program shall take proficiency examinations to gauge undergraduate knowledge in the four traditional areas of chemistry: analytical, inorganic, organic, and physical. These standardized tests by the American Chemical Society (ACS) take place during orientation week and the results are provided to students before registration but have no bearing on students' transcripts.

Students entering the PhD CHEM PHYS program must pass proficiency examinations in two areas of chemistry and two areas of physics (mechanics; electricity and magnetism). Students entering with a bachelor's or master's degree in chemistry who have not taken the physics courses previously can satisfy the physics requirement with "A"s or "B"s in PHYS 301, 302 (classical mechanics), and 376 (electromagnetism). Students entering with a bachelor's or master's degree in physics who

have not taken chemistry courses previously may satisfy the chemistry requirement with "A"s or "B"s in two of four courses, CHEM 301-302 (organic chemistry; the two-semester sequence counts as one course only), CHEM 320 (inorganic chemistry), CHEM 409 (instrumental analysis) or CHEM 510 (atomic and molecular structure).

Students entering the PhD programs in CHEB and NANO are not required to take proficiency exams.

F. Limits on Course Load and Continuous Enrollment

To be eligible for assistantship students must be full time and register at least 9 graduate credits per semester (but not more than 15) during pre-candidacy. **Once students apply and get PhD candidacy approved by the dean's office in the 4th semester, students must register one of two dissertation courses: HUMS 701 (9 credits, requires enrollment in the VCU health insurance) or 1 credit of CHEM 697 (no access to VCU health insurance program). Registration of HUMS 701 is mandatory for GTAs and PhD candidates supported on Altria fellowships. During post-candidacy, students supported on GRA (advisor's grant) or self, also have the option of registering 1 credit of CHEM 697 instead of HUMS 701 to further reduce costs in university fees (see above). VCU allows a maximum of 8 years to complete a PhD degree and 5 years for a MS degree. Even after the 10th semester when no GTA support is available, a student who continues in the program must register at least 1 credit per semester (CHEM 697) to maintain continuous enrollment unless a leave of absence is requested.**

<http://bulletin.vcu.edu/academic-regs/grad/registration-policies/>

<http://bulletin.vcu.edu/graduate/study/financing-graduate-school/satisfactory-academic-progress-financial-aid-purposes/>

<http://bulletin.vcu.edu/academic-regs/university/leave-of-absence/>

<http://bulletin.vcu.edu/academic-regs/grad/time-limit/>

G. Satisfactory Graduate GPA, Course Grades Allowed and Course Repeat Policy

Students on assistantship support whose graduate GPA falls below B (3.0) are given one semester to bring it back to B. If recovery does not occur within this time, the assistantship will be rescinded, and **the student will be dismissed from the program. Regardless of the financial source, VCU will not approve graduation in a graduate degree with a GPA below 3 (without rounding up) or a graduate course graded D or F. Likewise, students who receive 2 unsatisfactory grades "U" in a dissertation course (CHEM 697 or HUMS 701) will be automatically dismissed. VCU allows each program to determine its participation in the course repeat policy. The Chemistry graduate program does not allow graduate students to repeat courses when getting a C, D, F or U grade.**

<http://bulletin.vcu.edu/academic-regs/grad/satisfactory-academic-progress/>

<http://bulletin.vcu.edu/academic-regs/grad/theses-dissertations/>

H. Satisfactory Working Hours

Once students select research advisor (by October 31st when entering in Fall or March 31st when entering in Spring), they are expected to start going to the research labs to get acquainted with project techniques, associated literature, and initiate training with senior members. Upon completing core and elective courses (1st year), and despite being GTA, PhD students are expected to increase the hours devoted to research. **All in all, students are expected to treat their teaching/research responsibilities as a full-time job requiring at least 40 h/week, excluding lunch. Individual advisors may have their own expectations, therefore students are urged to communicate with their advisors at all times during graduate studies.**

I. Causes for Dismissal from the Graduate Program

- A GPA below 3 (B) without recovery after one semester. Getting a D-F grade in a graduate course.
- An F from an incomplete "I" grade not addressed by student for not contacting course professor after one semester.
- Two U-grades (unsatisfactory) in CHEM 697 or HUMS 701.
- Not passing the cumulative exams (2 out of 3) by the 2nd semester for PhD CHEM.
- Not passing the Oral Candidacy Exam by the end of the 4th semester for PhD CHEM.
- Unethical conduct in research/teaching not complying with VCU code of conduct <https://president.vcu.edu/policies/>

J. Seminar Program

This is a forum in which graduate students are exposed to visiting and local speakers from different disciplines in chemical sciences, including departmental faculty and students. The program is managed by the Graduate Administrative Assistant and the professor in charge of the seminar courses CHEM 690/692. The schedule is posted on CANVAS and is maintained by the Graduate Administrative Assistant. The program also includes special seminar series that are scheduled annually in honor of past departmental professors, like the Mary Kapp Lecture (Spring) and John Fenn Lecture (Fall). Seminars are scheduled twice a week on Tuesdays and Thursdays from 4:00 to 5:00 pm in Oliver Hall 1024 or via Zoom. Tuesdays are reserved for student research seminars while invited speakers are scheduled on Thursdays. Students are encouraged to interact with invited speakers when asked to volunteer in networking meetings with them and **are expected to attend at a minimum all outside**

speaker seminars, or as instructed by faculty seminar coordinator. To see the schedule, enroll in CANVAS using the link: <https://viriniacommonwealth.instructure.com/enroll/83TRAB>. Login in CANVAS and click on the Chem. Grad. Program course.

K. Program Withdrawal and Leave of Absence Requests

Students withdrawing from any graduate program (CHEM, CHEB or NANO) should notify with an email statement to the corresponding Graduate Director so that the College and the Graduate School can be informed promptly. Those students are also expected to follow the checkout procedure with the Graduate Administrative Assistant and the Building Manager.

Requests of *leave of absence* (LOA) from a program must be made by pdf letter to the program director indicating withdrawal and resumption dates along with a brief justification of the request. If the LOA is medical, description of private health details is discouraged, but a general doctor's note is still required by the dean's office. The graduate director submits a Special Action Form (SAF) to the dean's office on student's behalf. All justified requests are typically approved by the dean's office, **provided they are requested and approved before or during the first term of leave. Requests for retroactive LOAs will not be approved (see link below).** Students must announce the return to classes after a LOA with a pdf letter emailed to the graduate director before the semester classes start.

<https://bulletin.vcu.edu/academic-regs/university/leave-of-absence/>

2. Graduate Committees and Personnel

A. Graduate Recruiting and Admissions Committee (GRAC)

This committee is made up of 4 to 6 rotating professors from different areas in the Department and is led by an appointed committee chair. The committee's primary responsibilities include, recruiting, screening and selecting new graduate students every cycle. This committee also coordinates recruitment brochures and presentations.

B. Graduate Evaluation and Advising Committee (GEAC)

This body is made up of 5 professors, one from each of the four chemistry areas, in addition to the Graduate Director who acts as committee chair. At discretion of the Department Chair, membership to this committee rotates yearly among departmental PIs. The primary role of GEAC is handling academic issues regarding student performance, transfers, dismissals and appeals. It also oversees compliance with graduate rules and program assessment.

C. Graduate Director (GD)

The GD is appointed on a rotational basis by the Department Chair. General responsibilities comprise overseeing compliance in academic policy and facilitating the operation of the Graduate Program in coordination with other parties in the department (GEAC, GRAC, etc.) and university (College and Graduate School). Every year, the Graduate Director coordinates orientation week for new graduate students, the execution and grading of proficiency exams and the schedule of cumulative exams. The GDP also coordinates the annual program assessment in collaboration with GEAC and the Graduate Administrative Assistant.

D. Graduate Administrative Assistant

The Graduate Administrative Assistant provides an essential support to the function of the graduate program. Responsibilities include oral defense planning, procedural requests to the college and graduate school, seminar scheduling, orientation week preparation, poster session logistics, building access, check in and check out procedures for graduate students, scheduling of visiting speakers and graduate students.

E. Financial Manager

The Financial Manager handles and oversees financial matters pertaining grants and departmental accounts.

F. Building Manager

The Building Manager coordinates training and compliance to safety for all departmental personnel as well as students in teaching and research labs. Building security and Stockroom operation are also under the purview of the Building Manager. Students graduating or withdrawing from the program must sign off during checkout with the Building Manager.

G. TA Coordinator

Every semester, the distribution of TA assignments among graduate students is handled by the Associate Chair, who also coordinates the dissemination of teaching practices and standards in accord with VCU's mission. Students must comply with these guidelines to prevent withdrawal of GTA-support.

3. Requirements for PhD in CHEM

A. Student Learning Outcomes and Overview of Requirements

The attainment of any graduate degree conferred by the Department relies on the completion of various requirements that are integrated in several learning outcomes:

- Demonstrate expertise in chemistry
- Demonstrate effective oral and writing communication skills
- Demonstrate ability to analyze data critically in chemistry
- Demonstrate ability to conduct independent research correctly while abiding to safety and ethical standards

In addition to these cognitive skills in preparation for diverse careers in chemistry, publication of 3 articles (one per thesis chapter) in peer-review outlets is an adequate expectation for the PhD degree. Research articles and presentations at conferences and other forums significantly enhance job prospects.

Table 1 illustrates the major PhD requirements during pre- and post-candidacy for a student entering in Fall and Spring with a timeline of 10 semesters. Students, however, can finish in less than 5 years, if requirements are fulfilled early. Ideally, going from GTA to GRA is expected during post-candidacy if research funding is available. **In any case, no GTA support is provided beyond the 10th semester, therefore students are encouraged to follow the registration timeline outlined in Table 1.** This includes completing the pre-candidacy requirements of courses, cumulative exams, literature seminar and oral candidacy exam, in a timely manner. The tuition waiver for GTAs or GRAs during post-candidacy only allows registration of dissertation credits from HUMS 701 or CHEM 697 (or else extra charges will be billed to the student). Therefore, any non-dissertation course must be taken during pre-candidacy when the permitted load is between 9 to 15 credits per semester. To be eligible for GTA, PhD students must maintain full-time status by registering at least 9 credits of graduate courses, adding CHEM 697 as needed to maintain full-time status. An exception to this rule is given to GRAs in post-candidacy, who can choose between registering 9 credits of HUMS 701 or 1 credit of CHEM 697 (special GRA contract, see above).

Table 1. Example of 10-semester timeline for PhD in Chemistry

PRE-CANDIDACY 9 to15 CREDITS/SEMESTER ENTERING IN FALL					
Semester 1	Semester 2	Semester 3	Semester 4		
Core: CHEM 504, 510, 520 (9) CHEM 690 (1) CHEM 693 (1) CHEM 697 (4) Advisor selection by Oct 31 ^a Committee selection by the end of semester 1 ^b	Elective courses (9) CHEM 690 (1) CHEM 697 (4) CHEM 698 (1) CUMULATIVE EXAMS	CHEM 692 (1) CHEM 697 (11) CHEM 699 (3) LITERATURE SEMINAR	CHEM 690 (1) CHEM 697 (9) CANDIDACY EXAM ^c Candidacy Application		
15 credits	15 credits	15 credits	10 credits		
PRE-CANDIDACY 9 to15 CREDITS/SEMESTER ENTERING IN SPRING					
Semester 1	Semester 2	Semester 3	Semester 4		
Elective courses (9) CHEM 690 (1) CHEM 697 (4) CHEM 698 (1) Advisor selection by March 31 ^a	Core: CHEM 504, 510, 520 (9) CHEM 690 (1) CHEM 693 (1) CHEM 697 (4) CUMULATIVE EXAMS Committee selection by Sept 1 ^b	CHEM 692 (1) CHEM 697 (14) LITERATURE SEMINAR	CHEM 690 (1) CHEM 697 (6) CHEM 699 (3) CANDIDACY EXAM ^c Candidacy Application		
15 credits	15 credits	15 credits	10 credits		
POST-CANDIDACY 9 CREDITS/SEMESTER					
Semester 5	Semester 6	Semester 7	Semester 8	Semester 9	Semester 10
HUMS 701 ^d	HUMS 701 ^d	HUMS 701 ^d	HUMS 701 ^d	HUMS 701 ^d	HUMS 701 ^d THESIS DEFENSE RESEARCH SEMINAR
9 credits	9 credits	9 credits	9 credits	9 credits	9 credits

^aObtain Chair's approval and ^bnotify Graduate Director and Administrative Assistant. ^cDismissal or transfer to MS will ensue if not completed by the end of the 4th semester. ^dIt requires approved candidacy status and can be replaced by 1 credit CHEM 697 but only for GRAs.

B. Course Requirements

Students must take a minimum of 18 credits of graduate didactic courses, including 9 credits in three core areas and 9 credits of approved electives (Tables 2 and 3). Ideally, this course load should be completed during the first year or at least by the end of the third semester. **Students are urged to confirm their progress using Degree Works, which is VCU online system that automatically tracks coursework.** Courses like CHEM 693 (Chemistry Perspectives and Ethics) and CHEM 698 (Investigation in Chemical Literature) must be taken during the first year and before presenting the Literature Seminar (CHEM 692).

Both CHEM 697 and HUMS 701 are dissertation courses, but the latter was created to provide full-time status at a reduced tuition rate for PhD candidates regardless of their VA-residence status (pre-candidacy tuition costs double for VA non-residents). Therefore, HUMS 701 is a 9-credit course that both GTAs and GRAs are allowed to register but only after being approved PhD candidates by the dean's office and the graduate school. For this reason, it is imperative that upon passing the oral candidacy exam, **students** must immediately apply for PhD candidacy.

Table 2. Summary of Requirements for PhD in CHEM (60 total credits minimum)

Course		Credits	Semester Offered (when to complete it)
CHEM 504 Advanced Organic	Area core courses	3	Fall (1 st year)
CHEM 510 Atomic and Molecular Structure		3	
CHEM 520 Advanced Inorganic		3	
CHEM 693 Chemistry Perspectives and Ethics	1		
Electives from Table 3		9	Some in Fall, some in Spring (1 st year)
CHEM 690 Research Seminar		1 (3 times)	Fall and Spring (only in pre-candidacy)
CHEM 698 Investigation in Current Chemistry Literature		1	Fall and Spring (prior to literature seminar)
CHEM 692 Literature Seminar Presentation to committee ^a		1 (1 time)	Fall and Spring (only in pre-candidacy)
CHEM 699 Scientific Writing in Chemistry		3	Fall (1 st or 2 nd year prior to candidacy exam)
Dissertation Courses	CHEM 697 Directed Research	32	Fall and Spring (pre- and post-candidacy)
	HUMS 701 Post-candidacy Doct. Res.		Fall and Spring (only in post-candidacy)
Other Requirements			
Cumulative Exams (2 to 3)			Fall and Spring (2 nd semester)
Oral Candidacy Exam			Fall, Spring or Summer (4 th semester)
Application to Candidacy			4 th semester (immediately passing candidacy exam)
Research Seminar to the department			Graduation semester
Thesis manuscript (3-5 chapters) and final defense			Graduation semester
Electronic Thesis upload and Application Graduation			Graduation semester upon final defense

^aStudents must register CHEM 692 instead of CHEM 690 during the semester presenting the Literature Seminar.

Students who wish to lower the cost of their university fees are allowed to register 1 credit of CHEM 697 instead of HUMS 701. However, this option does not allow access to the VCU health insurance program and is only available for GRAs who have become PhD candidates (see section on tuition and contracts above).

Table 3. List of Core (C) and Elective (E) Courses Offered*

	AREA OR TOPIC	COURSE	NAME	CREDITS	SEMESTER
DIDACTIC	ANALYTICAL	CHEM 630 (E)	Electroanalytical Chemistry	1.5	Spring
		CHEM 631 (E)	Separation Science	1.5	Fall
		CHEM 633 (E)	Mass Spectrometry	1.5	Fall
		CHEM 635 (E)	Spectrochemical Analysis	1.5	Fall
		CHEM 636 (E)	Biosensors	1.5	Spring
		CHEM 637 (E)	Electrochemistry Applications	1.5	Spring
	INORGANIC	CHEM 520 (C)	Advanced Inorganic	3	Fall
		CHEM 622 (E)	Solid State & Materials	1.5	Spring
	ORGANIC	CHEM 504 (C)	Advanced Organic I	3	Fall
		CHEM 604 (E)	Advanced Organic II	3	Spring
		CHEM 506 (E)	Introduction to Spectroscopic Methods	1.5	Spring
		CHEM 606 (E)	Advanced Spectroscopic Methods	1.5	Spring
		CHEB 601 (E)	Chemical Biology I	3	Fall
		CHEB 602 (E)	Chemical Biology II	3	Spring
	PHYSICAL	CHEM 510 (C)	Atomic and Molecular Structure	3	Fall
		CHEM 511 (E)	Chemical Thermodynamics and Kinetics	3	Spring
		CHEM 512 (E)	Applied Molecular Modeling	3	Spring
		CHEM 691 (E)	Nanomaterials Energy & Environ Applications	3	Spring
	EDUCATION RESEARCH	CHEM 591 (E)	Introduction to Chemical Education Research	1.5	Spring
	LITERATURE ANALYSIS & WRITING	CHEM 698	Investigations in Current Chemistry Literature	1	Spring
CHEM 699		Scientific Writing in Chemistry	3	Fall	
NON-DIDACTIC	CHEM 690	Research Seminar	1	Fall & Spring	
	CHEM 692	Seminar Presentation	1	Fall & Spring	
	CHEM 693	Chemistry Perspectives and Ethics	1	Fall	
	CHEM 696	Professional Skill Development (MS students only)	3	Fall	
DISSERTATION COURSES	CHEM 697	Directed Research	1 to 11	Fall & Spring	
	HUMS 701	Post-Candidacy Doctoral Research	9	Fall & Spring	

*Students should corroborate actual course offering in the Schedule of Classes link on VCU website.

The grade for either course is S (satisfactory) or U (unsatisfactory) and is provided by advisor. Sections of CHEM 697 with variable number of credits are offered every semester to facilitate reaching the number of credits needed. Candidates on supported on GTA or Altria must register HUMS 701 without exception.

Students in the CHEM PHYS program are required to complete CHEM 510 or PHYS 580 plus CHEM 511, CHEM 612, PHYS 576, and PHYS 641 in addition to three courses from the following list: CHEM 512, 550, 591, 610, 611, 615, 616, 620, 634, 635, 691; PHYS 550, 571, 573, 591, 661, 691; MATH 517, 518; NANO 650, 651. A minimum of four graduate courses must be in chemistry. These students may also substitute 15 credits of PHYS 697 for 15 credits of CHEM 697.

C. Course Transfers, Waivers and Optional Undergraduate Courses

Students can request transfers in the form of **waivers** (up to 6 credits maximum) for courses taken at previous institutions or VCU by emailing the Graduate Director attaching the syllabus of the course taken previously along with the unofficial transcript, and the course at VCU to be waived. Once content is verified to be equivalent to the VCU course by the corresponding departmental division, the Graduate Director files a waiver request with the College, filling out an online [form](#), which typically takes 3 weeks for approval to appear in Degree Works. **VCU waives the course content but not the total number of credits required for a degree, therefore students should take dissertation credits in lieu of a waived course.** The course to be waived should be graded B or higher and appear on the official transcript of the previous institution. For students interested in refreshing basic knowledge in a core area, optional registration of undergraduate courses concurrent with the graduate courses is possible and without impact on graduate GPA. **However, students having no coursework experience in undergraduate Instrumental Analysis are required to take CHEM 409.**

D. Cumulative Exams

These are take-home exams aimed at expanding knowledge and enhancing critical analysis of selected topics of chemistry. The tests are written jointly by the faculty in each division (analytical, organic, inorganic, and physical) and offered simultaneously in the 4 areas, three times a semester on the second Saturday of the month. Evaluation is also performed jointly using a pass/fail criterion determined by each division and the grades are communicated to the students before the following exam. On the designated Saturday morning, students receive the exam by email or available on CANVAS at 9:00 am and return the answers no later than 3 hours later at 12:00 pm. Cumulative exams must be taken during the 2nd semester of PhD and to complete this requirement, students need to pass two exams, one on the area of concentration, and another outside the area. **Students not passing one of the two exams are required to take a third one, but should this be unsuccessful, transfer to MS will ensue.** Topics are announced at 2:00 pm on Friday a week prior to the exam and students must declare the exam area they will take by the following Tuesday using a google form. Use this link: <https://virginiacommonwealth.instructure.com/enroll/83TRAB> to enroll in CANVAS and see the exam schedule. Login in CANVAS and click on the Chem. Grad. Program course.

E. Seminar Attendance (CHEM 690) and Literature Seminar Presentation to Committee (CHEM 692)

During the four semesters of pre-candidacy, PhD-students are required to register one of two seminar courses: CHEM 690 when merely attending the seminar (3 semesters) and CHEM 692 when presenting the Literature Seminar (1 semester). Regardless of registration to CHEM 690/692, graduate students are expected to attend seminar, which runs twice a week on Tuesdays and Thursdays from 4:00 to 5:00 pm in Oliver Hall 1024, Temple 1165, or via Zoom. Tuesdays are reserved for student research seminars while invited speakers are scheduled on Thursdays. **Once approved to PhD candidacy, students must not register CHEM 690 or 692, to prevent a tuition charge billed to the student. However, all PhD students must present a research seminar to the department in their semester of graduation despite not registering CHEM 692 or obtaining an official grade. If graduation is expected in the summer semester, the departmental research seminar should be scheduled on the Spring semester prior to graduation. In any case, students are responsible for reserving a date from the CANVAS schedule and emailing title and abstract to the Graduate Administrative Assistant. Students are expected to attend all seminars by outside speakers or as directed by the seminar coordinator.** Use this link: <https://virginiacommonwealth.instructure.com/enroll/83TRAB> to enroll in CANVAS and see the seminar schedule. Login in CANVAS and click on the Chem. Grad. Program course.

Attendance to the seminar is required throughout the PhD but is only tracked during pre-candidacy with the grade for CHEM 690 (S or U). All PhD students must present a Literature Seminar during the second year (3rd or 4th semester) in a topic from the latest chemistry literature to their thesis committee. In the semester presenting the seminar, students are also required to register CHEM 692 instead of CHEM 690. This seminar is graded using the letter scale A to F. The objective of the seminar presentation is to broaden expertise, build up communication skills and sharpen critical analysis. **Once a topic is approved using the Literature Seminar Approval Form (see appendix below), students must email the signed form (pdf) to the Graduate Administrative Assistant, the professor for CHEM 692 and their thesis committee.** Students must also email the seminar abstract to the committee two weeks before the seminar date and ensure to practice at least once in front of advisor and other students. The title and date of the seminar should be notified to the Graduate Administrative Assistant to secure room reservation and guarantee that the committee will have the rubric to grade the seminar. For guidelines on abstract

preparation and seminar policy, students should consult the syllabus for CHEM 692/690 or ask the professor in charge of those courses.

After the Q&A session, each committee member evaluates the performance using the rubric in Table 4. In this score system, 100 to 90 is equivalent to A, 89 to 80 is B, and anything below 79 is C. Following deliberation led by the committee chair, individual faculty scores are combined to produce a single graded rubric that goes on file with all signatures. Before adjourning the meeting, the committee chair communicates the unified grade and recommendations to student. The committee chair should return the signed form to the Graduate Administrative Assistant so that an official grade can be submitted to the registrar by the professor in charge of CHEM 692. Students getting a C are allowed to repeat the seminar at committee's discretion and after requesting the professor in charge of CHEM 692 to file an incomplete grade "I". This requires a retroactive change of grade the following semester when the grade of the re-do becomes available. If the committee and student agree on a C without repeat, the student must get an A in another course to prevent the GPA going below B.

Topic selection for the literature seminar must be conducted following these guidelines:

- No direct overlap with student's research.
- It cannot include published work by student's advisor, collaborators or competitors.
- The student should be unfamiliar enough with the topic so that it constitutes an achievable challenge. Research articles must be from the last three years.

Table 4. Seminar Evaluation

		Does not Meet	Meets	Exceeds
	Score	0 to 5	6 to 8	9 to 10
Organization				
1. Ability to clearly explain a topic in the appropriate depth				
2. Ability to use slides and visual aids effectively				
3. Ability to communicate scientific information to an audience in a clear and understandable fashion				
4. Demonstrate breadth of knowledge in chemistry				
Delivery				
5. Ability to hold the audience's attention				
6. Ability to stay within the required time (40-50 mins excluding questions)				
Questions				
7. Ability to grasp material presented				
8. Depth of understanding of the topic and relevant background material				
Other				
9. Ability to write an abstract that properly conveys the content of a seminar				
10. Overall professionalism of the talk (e.g. punctuality, attire, etc)				
TOTAL/100 PTS		Combined score by committee		

F. Oral Candidacy Exam (Proposal Defense)

Schedule and Candidacy Application.

The Oral Candidacy Examination or Proposal Defense must be completed no later than the end of the 4th semester, regarded as the last day of Final Exams in the Monroe Park Campus for that semester on the VCU calendar. **Failure to meet this deadline will result in automatic dismissal or transfer to MS depending on the case.**

Once a defense date is agreed upon with the committee, the student must communicate this information along with the Title of the Proposal to the Graduate Administrative Assistant. This will ensure that a Defense Package with records and the grading rubric will be emailed to the committed for signing after the defense. Students are responsible for room reservation and informing/reminding the committee about the defense. Upon passing the candidacy exam, **students** must apply immediately for candidacy using a DocuSign online form available on the graduate school webpage <https://graduate.vcu.edu/forms/> or <https://graduate.vcu.edu/current-students/degree-candidacy/>). It is crucial that students

follow the instructions described in the form carefully, including all members of the committee, entering the correct email address (CHSGRADDEAN@VCU.EDU) and name of the associate dean, all of which are listed on the graduate school webpage for degree candidacy forms above.

Proposal Format.

Students must write an original proposal describing their research plan for their PhD including any preliminary data accrued to this point. The proposal must be sent to each member of the thesis committee at least a week prior to the scheduled defense. The document must be 13 (min) to 15 pages (max) numbered and not including the bibliography section. Margins must be 1 inch on all sides, and text written in single space with font 11 (Arial, Helvetica or Palatino linotype). Bibliographic references must be in the style of *The Journal of The American Chemical Society* (JACS) including article titles and inclusive pages. A minimum of 25 references must be cited with no more than 30% citations from the student's research group. Figures, schemes, and equations must be numbered and embedded in the section of text where they are described. The writing style must be clear and simple suited for general readership in chemistry. Students are urged to write the proposal following the format suggested in the course CHEM 699, Scientific Writing in Chemistry, which is mandatory for all graduate students.

Evaluation.

Table 5. Grading of Student Learning Outcomes

		Does not Meet	Meets	Exceeds
		1 to 5	6 to 8	9 to 10
SLO		Score		
1. Demonstrate breadth and depth in chemistry				
2. Demonstrate effective oral and writing communication skills in chemistry	Oral presentation			
	Candidacy/Thesis manuscript			
3. Demonstrate ability to analyze data critically				
4. Demonstrate ability to conduct independent research correctly while abiding to ethical and safety standards	Project progress			
		TOTAL		

On the day of the defense, the examination begins with the student giving a **20-minute presentation** summarizing the major points of the manuscript followed by rounds of Q&A from the committee. Each committee member evaluates performance using a rubric that assigns scores to various student learning outcomes (SLO) as shown in Table 5.

During deliberation led by the committee chair, scores from individual members are combined to come up with a unified quantitative evaluation that will go on record with signatures. **A total score of 28 or above (equivalent to 3 SLOs met and 2 unmet) represents a satisfactory passing result.** However, despite passing the exam, an unmet score (≤ 5) in a SLO may prompt the committee to give an assignment (*i.e.* progress update, written report, presentation, etc.) following a specific deadline. Additionally, when assessing project progress (SLO 4) the committee should rely on advisor's perspective as well as the research products (*i.e.* peer-review publications, posters, presentations, etc.) generated by the student (see full Defense Evaluation Form in appendix). When a student gets a total score **lower than 28 (unsatisfactory)**, equivalent to 3 or more SLOs unmet, the committee may take one of two options: 1) Grant a second attempt no later than 4 weeks after the first try; or 2) Allow a conditional pass that will be verified within a year and/or at the 4th year committee update in the 8th semester (see below). The committee selects either option based on consensus, the individual level of SLO performance (met, unmet, exceeded), and the likelihood of the student to improve by the second meeting time. **In any scenario, a student who performs unsatisfactorily the second time around may be transferred to MS at the end of the academic term. Rubric(s) from every attempt, scored and signed, must be kept on record, including brief evaluation rationales written in the form.**

G. _____ PhD Committee Update (4th year)

All PhD students must present a committee update during their 8th semester. This update will consist of an oral presentation to the committee on the project status and upcoming research plans. The presentation must be about 20 minutes, followed by a Q&A session. The student must submit a 2-page summary (not counting references) with results and future plans to the committee one week prior to the presentation. The summary must be 1-inch margin on all sides, 11 font arial, with no more than 15 references in bibliography. This committee update requirement is enforced by the graduate director and graded by the committee using the same rubric of the oral candidacy exam (see appendix). Students are expected to score higher than at the proposal stage, however even if the student earns a reduced grade, it is at committee's discretion to recommend transfer to MS or continue in the PhD, depending on holistic evaluation of performance and potential for improvement by the end of the degree. Students must inform the graduate administrative assistant about the title of the presentation and the date, time and location arranged with the committee.

H. Final Dissertation Defense

Every student is expected to complete an original research project under the guidance of an advisor and its results must be reported in a dissertation manuscript describing the research significance in relation to existing knowledge. Guidelines for preparation of the thesis can be found in the Graduate Dissertation Manual:

<https://graduate.vcu.edu/media/graduate-school/docs/pdf/ThesisandDissertationmanual8.27.2018.pdf>

When advisor and student collectively determine that sufficient research has been completed to write a **dissertation of 3 to 5 chapters (~ 3 to 5 research articles in addition to a detailed and relevant introduction section and conclusion/future directions section)**, the student should schedule the defense with the committee. The student should also notify the Graduate Administrative Assistant of the thesis title so that a venue can be reserved for the intended date. Copies of the dissertation should be made available to the committee one week prior to the defense.

Given that the PhD is awarded for addressing an original problem in research, evidence of publication (at least one manuscript draft submitted) in a peer-review journal should be presented to the committee at the time of the defense.

Nevertheless, to maximize job prospects and expand career opportunities, students are urged to produce as many publications as possible.

The evaluation of the thesis defense follows the format of the Oral Candidacy Exam using the same Defense Evaluation form to assess the same SLOs. Upon successful defense, the student must correct the manuscript following directions by the committee. The final version must be submitted online following the instructions described in the Electronic Thesis and Dissertation (ETD) webpage: <http://www.graduate.vcu.edu/student/thesis.html> before the deadline listed on the VCU calendar.

I. Research Seminar Presentation to the Department

In the semester of graduation, every student must present a seminar about the research performed at VCU. The objective of this presentation is to describe the investigation results in front of the departmental audience. To facilitate public announcement, students must email the seminar abstract to the Graduate Administrative Assistant two weeks in advance. Therefore, presenters are urged to schedule the seminar during regular schedule (Tuesdays or Thursdays 4:00 to 5:00 pm) or get permission from the professor in charge of seminar program when presenting at a different time. In the latter case, students must secure room reservation with the Graduate Administrative Assistant. The performance is still assessed with the evaluation form used for Literature Seminar (Section 3E) but the grade will not appear in transcript, therefore **PhD students must not register CHEM 692 for this seminar.**

J. Application to Graduation

During the first week of the semester of graduation, students must declare intent to graduate on e-services. Concurrently, they also need to schedule their thesis defense and research seminar (section 3H) while informing the Graduate Administrative Assistant of dates and thesis title. Because VCU requires registration of at least 1 credit during the final semester, graduating in summer will generate additional tuition and fee charges that will apply to the student or advisor's grant. Upon passing the final defense, the committee chair submits the thesis evaluation form (Appendix, same form used for oral candidacy exam) to the Graduate Administrative Assistant. Once the final and approved version of the thesis is uploaded on the corresponding VCU website, students must apply for graduation using the DocuSign form available on the graduate school webpage <https://graduate.vcu.edu/forms/>. This will start the automated signing by the committee members, graduate director, and corresponding associate dean. In order to participate in the hooding ceremony at commencement, students must have completed all PhD requirements, including electronic thesis submission. The Graduate School contacts students directly to let them know they have been approved for attending the hooding ceremony.

4. Requirements for PhD in CHEM with Chemical Education Focus

Students may select a chemical education focus for their PhD. These students will include chemical education research and work on an "atoms and molecules" project encompassing a traditional area of chemistry (physical, analytical, organic, inorganic, or chemical physics). Consequently, students are required to publish in both areas. Likewise, the Department offers a course in Chemical Education Research, CHEM 591, as well as cumulative exams in research education topics. All other requirements are identical to those for the PhD in CHEM.

5. Requirements for MS in CHEM with Thesis and Non-Thesis Options

Table 6 summarizes the MS requirements also outlined in the graduate bulletin at:

<http://bulletin.vcu.edu/graduate/college-humanities-sciences/chemistry/chemistry-ms/#degreerequirementstext>

Table 6. Summary of Requirements for MS in CHEM (30 total credits minimum)

Course Requirement		Credits		Semester offered (when to take it)
		Thesis	Non-Thesis	
CHEM 504 Advanced Organic	Area core courses	3	3	Fall (1 st year)
CHEM 510 Atomic and Molecular Structure		3	3	
CHEM 520 Advanced Inorganic		3	3	
CHEM 693 Chemistry Perspectives and Ethics		1	1	
Electives from Table 3		6	9	Fall and Spring (1 st year)
CHEM 696 Professional Skill Development		3	3	Fall (1 st year)
CHEM 698 Investigation in Current Chemistry Literature		1	1	Fall and Spring (1 st year)
CHEM 692 Seminar Presentation to committee ^a		1	1	Graduation semester
CHEM 697 Directed Research		9	6	Throughout the degree
Other Requirements				
Application to Candidacy		yes	yes	After defense/report to committee
Thesis (1-2 chapters) with defense to committee		yes	no	Graduation semester
Project Report (5 pages) with Q&A to committee		no	yes	Graduation semester
Application for Graduation		yes	yes	After passing defense

^aThis presentation comprises the research described in the thesis or the written project report for the non-thesis option

A. Student Learning Outcomes and Overview of Requirements

The learning outcomes for MS in chemistry are the same as in PhD (Section 3A), with the difference being the depth and amount of research performed (see above). Students must complete core and elective courses (Table 6) adding up to a total of 30 credits. There is no financial assistance, therefore students are allowed to follow their own pace, however, the maximum time allowed to complete a MS degree is 5 years. MS students must also take the proficiency exams in the four chemistry areas during orientation week and the results should guide the selections of elective courses to alleviate weaknesses disclosed in the exams. **PhD students can transfer to MS** after emailing a formal request to graduate director and selecting the MS-track most compatible with their progress attained during PhD. MS students wanting to transfer to PhD must apply following the process described on the departmental webpage, but the admission committee will only consider applications from students who have completed all requirements for the MS program even without graduating. All core and elective courses from the MS at VCU can be transferred to the PhD if the transfer is done without time gaps.

Tables 7 and 8 illustrate timelines for MS both in the thesis and non-thesis tracks. The MS with thesis requires working on an original research project under the supervision of an advisor in the department. A thesis manuscript about the project is to be presented to the thesis committee in a seminar (CHEM 692) scheduled during the graduation semester. Students must also complete a thesis defense to the committee and upload the final version of the thesis manuscript on the Electronic Thesis and Dissertation (ETD) webpage before deadline listed on the VCU calendar.

Table 7. Example of 4-semester timeline for **MS CHEM Thesis Option** (30 total credits minimum)

Semester 1	Semester 2	Semester 3	Semester 4
Core: CHEM 504, 510, 520 (9) CHEM 693 (1)	Elective courses (6) CHEM 698 (1) CHEM 696 (3)	CHEM 697 (5)	CHEM 692 (1) CHEM 697 (4)
Adviser selection by Oct 31 (Fall start) or March 31 (Spring start) ^a Committee selection by the end of semester 1 ^b			RESEARCH SEMINAR DEFENSE TO COMMITTEE
10 credits	10 credits	5 credits	5 credits

Table 8. Example of 4-semester timeline for **MS CHEM Non-Thesis Option** (30 total credits minimum)

Semester 1	Semester 2	Semester 3	Semester 4
Core: CHEM 504, 510, 520 (9) CHEM 693 (1)	Elective courses (9) CHEM 698 (1) CHEM 696 (3)	CHEM 697 (3)	CHEM 692 (1) CHEM 697 (3)
Adviser selection by Oct 31 (Fall start) or May 31 (Spring start) ^a Committee selection by the end of semester 1 ^b			RESEARCH SEMINAR Q&A TO COMMITTEE
10 credits	13 credits	3 credits	4 credits

^aStudents commencing in Fall or Spring must get approved by Department Chair's approval and ^bnotify Graduate Director and Administrative Assistant.

The non-thesis option also requires an advisor in the department, but coadvisors in other departments, industrial or government labs are also allowed. A research project of experimental or theoretical nature is to be completed by the student and presented to the committee in a written report that is also presented as a seminar (CHEM 692) during the semester of

graduation. The project can consist of learning a technique, investigating a chemical problem, or performing data analysis from a chemical inquiry, but it does not need to be an original research project. This work can be done while the student is fully employed or in internship at the site of employment or in a PI's lab at VCU.

B. Research Seminar Presentation to Committee (CHEM 692)

In the semester of graduation, MS students in the thesis and non-thesis tracks, must register CHEM 692 to be graded with a seminar presentation of their lab work to their committee. These seminars are graded with the same rubric used for PhD literature seminars (see above) and the grade from the committee must be communicated to the Graduate Administrative Assistant and the Professor in charge of CHEM 692 by the committee chair. This presentation is graded using the letter scale A to F and a seminar abstract must be emailed to the committee a week before the seminar date. Students should practice at least once in front of advisor and other students. The title and date of the seminar should be emailed to the Graduate Administrative Assistant to reserve a room and have the grading rubric sent to the committee. For guidelines on abstract preparation and seminar policy, students should consult the syllabus for CHEM 692 or ask the professor in charge of the course. After the Q&A session, each committee member evaluates the performance using the rubric in Table 4. In this score system, 100 to 85 is equivalent to A, 84 to 65 is B, and anything below 64 is C. Following deliberation led by the committee chair, individual faculty scores are combined to produce a single rubric grade that goes on file with all signatures. Before adjourning the meeting, the committee chair communicates the unified grade and recommendations to student. The committee chair then returns the signed form to the Graduate Administrative Assistant so that an official grade can be submitted to the registrar by the professor in charge of CHEM 692. Students getting a C are allowed to repeat the seminar at committee's discretion and after requesting the professor in charge of CHEM 692 to file an incomplete grade "I". This requires a retroactive change of grade the following semester when the grade of the re-do becomes available. If committee and student agree on a C without repeat, the student must have an A in another course to prevent the GPA going below B.

C. MS Candidacy Application

Both MS-thesis and non-thesis students are required to apply for degree candidacy with the college and the graduate school. This process can be done after completing core and elective courses or during the semester of graduation. Students should initiate the application via DocuSign on the graduate school website at <https://graduate.vcu.edu/forms/> including all committee members, graduate director, and corresponding associate dean. Instructions are provided on the website.

D. Final Defense and Application to Graduation for MS-Thesis Track

During the first week of classes in the graduation semester, students must declare intent to graduate in e-services and plan for a defense to the committee about their research. This defense should be done during the Q&A session after the research seminar and should be evaluated with the rubric in Table 5 aside from the seminar grade for CHEM 692 (see section 5B). Therefore, students must email thesis title and date to the Graduate Administrative Assistant so that the defense evaluation form is provided to the committee for signing. Once the committee chair returns the signed form to the Graduate Administrative Assistant and the final version of the thesis is approved, students must apply for graduation using a DocuSign link given in the graduate school website for graduation application: <https://graduate.vcu.edu/forms/>. Students must include the name and email addresses of all committee members, graduate director, and corresponding associate dean. This automated signing must be initiated only after uploading the final approved version of the thesis on the VCU webpage for thesis upload <http://www.graduate.vcu.edu/student/thesis.html> and before the deadline stated in the VCU calendar.

E. Final Written Report and Application to Graduation for MS-Non-Thesis Track

Students on the MS-Non-Thesis track are expected to write a final report of 7 to 10 pages (including figures and references but excluding the title page) at single space in font size 11 (Arial, Helvetica or palatino linotype) and 1-inch margin all sides. This manuscript is about experimental or theoretical work conducted by the student on learning a technique, investigating a chemical problem, or doing data analysis under the guidance of advisor. The report is expected to contain the following sections:

- Title of the project
- Introduction: explaining the goal and scope of the project detailing some background on the state of the art of the issue with perceived weaknesses and strengths and how they will be addressed.
- Materials and Methods: describing experimental or theoretical approaches to the project.
- Results and Discussion: describing data and analysis.
- Conclusions: summarizing results and corollary statements.
- References (no more than one page) in the style of *The Journal of The American Chemical Society* (JACS) including **article titles and inclusive pages**. No more than 30% of citations should be from the student's group.

Students must email the report to the committee one week prior to the seminar presentation. Likewise, the title, date and location should be communicated to the Graduate Administrative Assistant, so that a seminar rubric is provided to the

committee on the day of the seminar. The seminar is followed by a Q&A with the committee about the presentation and final report. Once the seminar is graded and the committee shares the feedback with the student, the committee chair must email the grade and the filled-out form to the Graduate Administrative Assistant to communicate the grade to the professor in charge of CHEM 692. If the seminar grade is C, the student must have an A-grade on another course to be approved for graduation, otherwise the seminar would have to be repeated in the same or a following semester at committee's discretion. The latter option will require the student to request an incomplete grade "I" in CHEM 692, and then file a retroactive change of grade once the new grade is available. Because this degree does not require a thesis, students do not need to upload the final MS report nor submit a Docusign thread to the committee to verify the upload. VCU will process graduation once all grades and courses have been completed in Degree works, and provided the student has "declared intent to graduate" on eservices during the first week of classes in the semester of graduation. The "intent to graduate" triggers the verification process in Degree works for VCU to confer the degree.

6. Course Registration

To register online, go to www.vcu.edu and click on "Register for Classes" on the top menu, then select "Register for Classes Using e-services". You will need the course registration number (CRN) which can be found by clicking on "Schedule of Classes" on the same webpage. After picking the current semester, selection of CHEM, CHEM BIO, or NANO, will display the courses offered in those subjects. When clicking in a particular course, you can determine its CRN, instructor, sits available, course capacity, time and location. The system does not allow registration of courses with conflicting schedules. However, should your TA assignment overlap with CHEM 690, you can still register the course but the professor in charge of CHEM 690/692 needs to be informed that your attendance to seminar will be limited because of GTA. In case of getting a no-allowed to register message because of lacking a pre-requisite, email the Graduate Director to authorize an override.

Typically, students devote the first semester to satisfy the core courses while registering electives in the second semester (Table 2) or vice versa if entering in Spring. In any case, the primary goal is to complete the 18-credit minimum of didactic courses by the end of the first year or at least by the 3rd semester. The same goal applies to MS students and their core/elective courses. Students must never register summer credits unless graduating on a summer period, in which case they must register 1 credit of CHEM 697. However, charges will apply to the student or advisor's grant.

7. Incomplete Grades, Drops, Withdrawals, and Retroactive Requests

Professors may submit an incomplete grade "I" to the registrar when a student does not finish assignments or exams in a course. **In such circumstances, students must contact the professor and address the reason of the "I" grade immediately because VCU converts those grades to F at the end of the following semester** (see VCU calendar). **Getting an F-grade in any course will trigger automatic dismissal from the graduate program.** The "I" grade must be retroactively changed by the professor of the course once a grade becomes available when the student completes the missing exams/assignments. Students can drop a course in e-services during the add/drop period in the first week of classes of the corresponding semester as scheduled in the VCU calendar. Course withdrawals can also be done by the student in e-services, provided it occurs before the withdrawal deadline indicated in the VCU calendar for the specific semester. Tuition is prorated to the time of withdrawing from the course, while a drop leads to no charge in tuition. If a drop/withdrawal leaves a course load lower than 9 credits (full time), PhD students will not qualify for GTA and tuition waiver. Retroactively deregistering a course past the withdrawal deadline can only be done by Special Action Form (SAF) requested to the Dean's office through the Graduate Director. A compelling reason must be added to the request, whose approval remains at discretion of the Associate Dean of the College.

8. Research Advisor Selection

One of the most important decisions a graduate student will make is the selection of their research advisor. During orientation week, departmental PIs present summaries of their research to the entering graduate class. In addition, the Department and the Chemistry Graduate Student Association hosts a graduate student poster session in August where all the current graduate students in Chemistry present their individual projects each year. **Attendance at these two events is mandatory.** Students are then urged to meet *individually* with as many PIs as possible to discuss potential projects and fully understand the expectations for successful graduation **Students are urged to have at least three choices for advisor.**

Questions to Consider Asking Prospective Advisors

- What thesis projects would be available if I were to join your group? Would these projects expose me to a variety of different approaches and/or techniques?
- In general, what is your availability to answer questions and provide help to your graduate students. Are you hands-off or hands-on?
- What is your philosophy regarding the amount of guidance the advisor should provide to a student during preparation of literature seminars, research proposal preparation, thesis writing, etc.?

- What are your expectations for the amount of time I should spend each day/week in your group/lab? What about vacations?
- How many graduate students are currently in your group?
- Do you have regular group meetings?
- Do you have funding for this project or currently seeking funding?
- Do you support your students as an RA during the academic year? In the summer?
- Do your students attend and present their work at scientific meetings outside work where they can interact with colleagues/researchers from other institutions? How are these trips funded?
- How long do you think it should take me to get my degree?
- What are your former graduate students (if any) doing now?
- What is your general philosophy of graduate training and what goals do you have for your graduate students?

In order to approve an advisor choice made by a student, the department chair carefully ponders the following questions: (1) Does the advisor have funding to support students on GRA; (2) Does the advisor use funds to support RAs (e.g. as opposed to using it to pay a technician or postdoctoral research associate); (3) How many students does the advisor currently have in his/her group on the TA and RA support and are any of these students graduating within a year? (4) Does the advisor support students during the summer as an RA? (4) Is the research advisor a tenure-track assistant professor that is currently growing his/her research group? (5) If the advisor is not fully funded, is the advisor actively and consistently submitting proposals for external funding?

While the department chair does her best to ensure that students go with their first-choice advisor, sometimes it is not possible because of limited funding, lab vacancies exhausted, insufficient lab space or equipment, and other factors related to the queries above. Therefore, it is vital that you, the student, discuss your interests with plausible research advisors ahead of time and make sure you have 2nd and 3rd choices, in case the first one becomes unavailable. Please keep in mind that research labs fill up rather quickly, so please do not delay this decision.

Summary of Research Advisor Selection:

1. Attend PI presentations during Orientation Week
2. Attend Department Poster Session and talk to your fellow graduate students
3. Meet individually with faculty
4. Have three choices for advisor
5. Meet with first choice and obtain the proposed advisor's signature on the Advisor Selection Form (appendix)
6. Submit the form to the Department chair for final signature and approval.
7. Notify the graduate director and graduate administrative assistant after approval by the chair
8. In consultation with the research advisor, select a thesis committee by the end of the first semester because presentations in the poster session are checked by the committee members.

Deadline: All students and are expected to obtain selection approval from the Department Chair **no later than October 31 (entering in Fall) or March 31 (entering in Spring)**. A "U" grade in CHEM 697 will be assigned if this deadline is not met. **Please do not delay.**

9. Change of Advisor During Graduate Studies

As the advisor-student relationship is one of mutual agreement, it may be terminated by either party. However, both the student and advisor are urged to communicate candidly to work out a plan for resolving sources of conflict promptly. Switching labs at any stage is highly disruptive for both parties and the department as a whole. Additionally, budget constraints do not allow extending GTA appointments for PhD students beyond the 10th semester regardless of the time of switching. Therefore, the department encourages as a first option, for student and advisor to continue and finalize the degree upon reaching a satisfactory agreement. If leaving a lab becomes inevitable for a student, the process must start as soon as possible because the change will surely entail beginning a different project with a new advisor. In any case, VCU forbids retaliation by either party and prohibits students from switching labs to avoid misconduct accountability. **For student-driven requests**, the student needs to meet with the Graduate Director and discuss the situation. If the student works in the Graduate Director's research group, the student needs to meet with the Chair of the Department. The Graduate Director and/or Department Chair will discuss options with the student, which will include the possibility of choosing another advisor within the department to complete the degree (MS or PHD). If an advisor change is needed, the research advisor will be notified of the student's desire to change groups by either the Department Chair or the Graduate Director and the student will be instructed to begin the process of finding another advisor in the Department of Chemistry (NOTE: the student is strongly advised to read section 8. Research Advisor Selection). Within 5 business days, the student will notify the Graduate Director and Department Chair if a possible new research advisor has been found. Also, within 5 business days, the student's research

advisor can meet with the Department Chair and Graduate Director to discuss the situation, if so desired. Ultimately, the Graduate Director and the Chair of the Department will make the final decision to (1) allow the student to choose another advisor within the department to complete the degree (MS or PhD); (2) transfer the student to the MS-non thesis track (unless already enrolled in it) starting the next term, particularly if a suitable advisor is not found for the student. PhD students who transfer to MS are not eligible for GTA and tuition waiver. **For advisor-driven requests**, once the decision is communicated to the department chair and graduate director, options (1) or (2) above may also be taken depending on the case.

In any change scenario, requested by student or advisor, **both must agree** on a satisfactory close out plan approved by the department chair. The plan must be detailed in a close out form (see appendix) signed by student, advisor, and chair. The plan must be executed within no more than 30 days, including a second round of signatures from the 3 parties upon plan completion. The activities outlined in the plan must be specific, concrete, and with end-points attainable during the 30 days provided. A student who does not satisfy the close out plan by the deadline, must request an extension to the chair or face dismissal from the graduate program. A new advisor selection form (see appendix) must be signed with the new advisor, along with the assembly of a new thesis committee. The student must submit all signed forms (digital or print out) and names of the new thesis committee to the graduate administrative assistant.

10. Thesis Committee Selection

In consultation with advisor, students should select a thesis committee made of at least 4 members including advisor and an out-of-department member. Ideally this committee should also have one member from the student's concentration area and another from out-of-area. This guideline should be followed in so far as the number of "free" faculty allows it. In the end students and advisors must select committee members from the list of available faculty members compiled every semester by the Graduate Administrative Assistant. This list is updated every semester based on the limit of thesis committee memberships per PI. **Students must notify the Graduate Administrative Assistant by February 1 (entering in Fall) or September 1 (entering in Spring) of their committee so that the corresponding paperwork can be initiated with the College and the Graduate School.**

11. Graduate Poster Session

All graduate students except those in the MS-non thesis track or who have not selected advisor must present a poster about their research project at the Graduate Poster Session scheduled by the department every year. Not presenting the poster will lead to "U" grade in CHEM 697 or HUMS 701. **First year students are urged to meet with advisor as soon as possible to determine the scope of material to be presented in their first poster, however, it is mandatory for all students enrolled in a research lab as GTA, GRA, or MS-thesis, to present a poster.** Students must e-mail the poster file (pdf) to their thesis committee and let them know of presentation times so that members can stop by the poster. Students must follow Graduate Administrative Assistant instructions for printing posters and presentation scheduling.

12. Support for Graduate Student Travel

Students can apply for travel support (up to \$400) once during their PhD or MS if they maintain full time status and the request is approved by the research advisor. To qualify for this financial aid, the applicant must be the first author of the presentation at the intended conference. Students must fill out the travel application form (Appendix) and have it electronically signed by the Graduate Director and Department Chair. Subsequently, students must email the signed form to chemtravel@vcu.edu for processing. All travel guidelines required by the University at <https://procurement.vcu.edu/i-want-to/travel/> must be followed. Graduate students are also encouraged to seek travel support (up to \$500) from the Graduate School using the link below:

<https://graduate.vcu.edu/current-students/awards-and-competitions/travel-grants/>

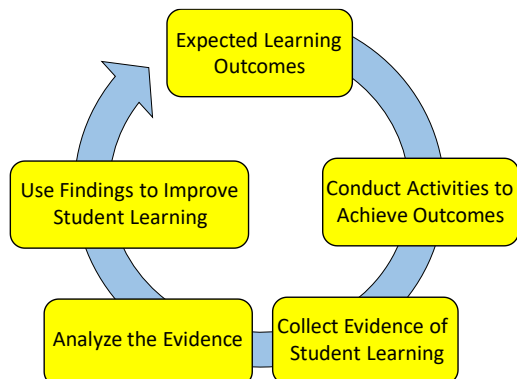
13. Career Plans

Beyond acquiring specialized knowledge in chemistry, benefits of doctoral education comprise a set of transferable skills that include **complex problem-solving, critical reasoning and thinking in-depth from different perspectives**. These skills, which are represented in the SLOs described in section 3.A, are advantageous in any professional environment but particularly in non-academic settings where a more diversified workforce is expected and doctorate holders can distinguish themselves from colleagues. In addition to the goal of cultivating these skills and producing publications as part of the graduate degree, students are encouraged to begin mapping out career paths as early as they can. There are internet sites like <https://www.acs.org/content/acs/en/careers.html> (from the American Chemical Society, ACS), which has a "career navigator app" that provides resources and information pertaining different professions in chemical sciences. The site <https://cheekyscientist.com/> specializes in helping science PhD holders find their career niche. Likewise, VCU offers courses like GRAD 615 Careers in Biomedical Sciences and GRAD 610 Career Planning for Graduate Students, which also provide career advice and resources.

14. Assessment of Student Learning Outcomes

In order to maintain curriculum integrity and monitor its alignment with SLOs, the department performs an annual evaluation using the assessment management software TaskStream in compliance with the VCU-Provost office:

<https://provost.vcu.edu/academics/assessment/>



This initiative is aimed at attaining the following goals:

- Maintain an evidence-based repository of student's learning on an annual basis.
- Provide students with the opportunities they need to achieve the expected learning by making judicious curriculum modifications based on the learning data collected.
- Maximize student's success not only in the program but after graduation when transferable skills derived from SLOs become the bedrock of work performance.

The Curriculum Map for the CHEM-Graduate Program (Appendix) shows every requirement and graduate course tabulated in line with the SLOs listed in section 3.A. The assessment is conducted annually whereby data collected is

presented to the department and analyzed during the Faculty Retreat every August. Faculty and thesis committees directly collect most of the data but the Graduate Director, GEAC and the Graduate Administrative Assistant help in putting together tables and summaries that are presented for analysis and discussion. Grades from courses and quantitative evaluations obtained with rubrics for different requirements make the core of the data collected but research products like conference attendance, presentations and publications are also considered.

15. GTA Assignments and Responsibilities

A graduate teaching assistant contract is a 20 hours/week contract. You will rarely, if ever, spend 20 hours in one week on your teaching assignment assuming you are managing your time properly. It is your responsibility to manage your time to allow enough time to excel in your own coursework, devote appropriate time for research as determined by your research advisor, and provide excellent teaching efforts to your assigned classes and students. As a teaching assistant in the Chemistry Department, you have the following obligations. Termination of a TA appointment is possible if these obligations are not followed. Please **understand the policies set forth by the university** (<https://president.vcu.edu/policies/>)

1. VCU prohibits discrimination on the basis of sex in any of its education programs or activities.
2. VCU prohibits retaliation against an individual for reporting prohibited conduct, filing a formal complaint, or participating in an investigation.
3. VCU encourages anyone who experiences retaliation to report it to Equity and Access Services.
4. Virginia Commonwealth University is committed to maintaining learning and work environments free from conflict of interest, exploitation, or favoritism. Employees, whether faculty or staff, shall not engage in consensual relations with students whenever the employee has a "position of authority" with respect to the student in any context, including but not limited to teaching, advising, training, providing recommendations for, evaluating, supervising, mentoring, or in the context of any student employment situation regardless of full or part-time status, for example as part of laboratory or other graduate assistant responsibilities, as part of clinical service or learning, or in the context of supervised graduate student teaching activities.
<https://vcu.public.doctract.com/doctract/documentportal/08DA32A740D2EE13588F6594282CD13B>)
5. Listing of other relevant VCU Policies
 - [Interim Title IX Sexual Harassment Policy](#)
 - [Interim Sex-Based Misconduct Policy](#)
 - [VCU Notice of Nondiscrimination, equal opportunity and affirmative action](#)
 - [Preventing and Responding to Discrimination Policy](#)

Keep to the following guidelines

1. Arrive **at least five minutes** prior to the start of your assigned class time, checking the laboratory to verify all necessary items are available, and respecting students as learners.
2. Do not date, flirt with, party with, or become friends with students in your classes. They are not your friends. You are a mentor and teacher. Any relationship beyond professional will never be equal. It's a University rule. It could cost you your job, reputation, and interfere dramatically with your plans.

3. Think twice before making any jokes or comments that could be construed as biased or insensitive. They are not your friends. You are a mentor and teacher. It's a University rule. It could cost you your job, reputation, and interfere dramatically with your plans.
4. During class time, your attention is to be focused entirely on your students and teaching, **not** your own classwork, your phone, your friends, etc. Respect for co-workers, laboratory and office staff, is required.
5. Engage with your students during laboratory periods and be prepared to help students with questions. Let students know when you are available to help them outside of the laboratory. Treat all students fairly and equally.
6. Maintain course attendance and grade records in accordance with Chemistry Department guidelines and the faculty instructor.
7. Respond to emails quickly and efficiently.
8. Attend **all** scheduled course staff meetings and grading sessions and proctor scheduled exams. Arrive on time.
9. Clearly and fully understand the material to be covered in the lab session, how to handle it in the laboratory, and how it is related to the lectures.
10. Return graded quizzes, laboratory reports, and problem assignments at the next laboratory session, unless otherwise instructed by the faculty instructor.
11. Grade accurately and fairly following guidelines provided by the faculty instructor.
12. Comply with chemical hygiene and safety regulations established instructor, faculty instructor, department and university. As a minimum student must wear safety goggles at all times; they are not to wear shorts.
13. Promptly relay any problems encountered with the experiments or laboratory sessions to the supervising faculty member.
14. Leave laboratories clean and orderly at the end of each lab session. Report equipment maintenance or room maintenance problems to the chemical stockroom personnel.
15. Comply with chemical hygiene and safety regulations established by the Department and outlined in the Chemical Hygiene and Safety Regulations for the University. You are responsible for students following safety protocols. Never, ever allow students to be lax on safety issues. Accidents occur in seconds.
16. Turn in final laboratory grades by the date designated by the faculty instructor.
17. Be available until the final grades for your course have been assigned or as defined by the faculty instructor

APPENDIX

Important Forms and Rubrics



VCU

Approval Form for Literature or Research Seminar

Topic selection for the literature seminar must be conducted following these guidelines:

- No direct overlap with student's research.
- It cannot include published work by student's advisor, collaborators or competitors.
- The student should be unfamiliar enough with the topic so that it constitutes an achievable challenge. Research articles must be from the last three years.

Date: _____

Student name: _____

Advisor name: _____

Important: Once the seminar date has been assigned, the student may not cancel or delay the seminar without permission from his/her committee. Abstracts are due to the CHEM 690/692 professor two weeks prior to the seminar date.

Proposed Title:

Description of topic (for literature seminar; min of 150 words):

List of pertinent references including titles (at least 3 recently published – for literature seminar):

Seminar Date and time: _____

Location: _____

Approved: Sign and Date

Research Advisor _____

Below area is for literature seminar only

Committee member _____

Committee member _____

Committee member _____

Committee member _____

Committee member _____

Literature or Research Seminar Rubric

Student's name _____ Semester student entered graduate school _____

Area of Concentration _____ Today's date _____

To Research advisor:

Date(s) and time of practice for literature seminar with student (must be at least 1):

List names of students present at practice for literature seminar (must be at least 4):

Comments:

To Committee Chair: please give each committee member a copy of this rubric at the beginning of the exam. The copy that goes on record will have the signatures and the **average score** per graded item.

Seminar Evaluation

		Does not Meet	Meets	Exceeds
	*Score	0 to 5	6 to 8	9 to 10
Organization				
1. Ability to clearly explain a topic in the appropriate depth				
2. Ability to use slides and visual aids effectively				
3. Ability to communicate scientific information to an audience in a clear and understandable fashion				
4. Demonstrate breadth of knowledge in chemistry				
Delivery				
5. Ability to hold the audience's attention				
6. Ability to stay within the required time (40-50 mins excluding questions)				
Questions				
7. Ability to grasp material presented				
8. Depth of understanding of the topic and relevant background material				
Other				
9. Ability to write an abstract that properly conveys the content of a seminar				
10. Overall professionalism of the talk (e.g. punctuality, attire, etc)				
*TOTAL/100 PTS				

*A = 100-90; B = 89-80; C ≤ 79. Students graded C are allowed to repeat the seminar at committee's discretion.

Recommended grade: _____

Comments/Justification:

Below area is for literature seminar only

Is a second seminar required: Yes/No; if yes, when? _____

NAMES AND SIGNATURES OF COMMITTEE MEMBERS INCLUDING DATE

Chair: _____ Department of _____

Advisor: _____ Department of _____

Member: _____ Department of _____

Member: _____ Department of _____

Member: _____ Department of _____

COLLEGE OF HUMANITIES AND SCIENCES
DEPARTMENT OF CHEMISTRY

Defense Evaluation Form

TYPE OF EXAM

PhD Committee Update

PhD Oral Candidacy 1st Try

PhD Thesis Defense

PhD Oral Candidacy 2nd Try

Master Thesis Defense

Student's name _____ Started in: FALL SPRING OF _____

Area of Concentration _____ Today's date _____

To Committee Chair: The copy on record must be signed with committee average scores per Student Learning Outcome (SLO). A student needs a total ≥ 28 to pass (satisfactory). When getting less than 28, the committee may grant a second attempt within 4 weeks of the first try (candidacy exam or defenses), or a conditional pass to follow up within a year and/or at the 4th year update depending on committee consensus and individual SLO scores (write justification below). Transfer to MS (not eligible for GTA support) at the end of the term will ensue when the student gives an unsatisfactory performance (<28) at the second try.

I. SLO EVALUATION

SLO	*Score	Does not Meet	Meets	Exceeds
		1 to 5	6 to 8	9 to 10
1. Demonstrate breadth and depth in chemistry				
2. Demonstrate effective oral and writing communication skills in chemistry	Oral presentation			
	Candidacy/Thesis manuscript			
3. Demonstrate ability to analyze data critically				
4. Demonstrate ability to conduct independent research correctly while abiding to ethical and safety standards	Project progress (see section II)			
**TOTAL				

*Despite passing the exam, the committee may give an assignment following a deadline to improve a SLO scoring below 5.

II. LIST OF PRODUCTS FROM THIS PROJECT BY STUDENT (SLO 4)

In presentations outside VCU: Oral _____ Poster _____

Or as primary (1st) or secondary (2nd) co-author in peer-reviewed journals: Published ____ (____) Submitted ____ (____)

If this project in the hands of this student has no publication yet, what is the likelihood from 1 (low) to 10 (high) that this student gets primary co-authorship in a published article before the end of the 10th semester? _____

III. THE RESULTS OF THE EXAM WERE

SATISFACTORY

(PASS)

UNSATISFACTORY

(NO PASS)

Is a second meeting necessary? NO / YES When? _____ Reason: UPDATE SLO # _____ 2nd TRY

IV. COMMENTS/JUSTIFICATION _____

NAMES AND SIGNATURES OF COMMITTEE MEMBERS INCLUDING DATE

Committee Chair: _____ Department of _____

Advisor: _____ Department of _____

Member: _____ Department of _____

Member: _____ Department of _____

Member: _____ Department of _____

Signature of Program Director _____ DATE _____

CURRICULUM MAP GRADUATE PROGRAM CHEMISTRY

				Goal 1 Establish expertise and communication skills in chemistry	Goal 2 Demonstrate independent critical thinking in chemistry			
				Student Learning Outcomes				
		CREDITS	CATEGORY	COURSE/ REQUIREMENT	1.1 Demonstrate breadth and depth in chemistry	1.2 Demonstrate effective oral and written communication skills	2.1 Demonstrate ability to analyze data critically	2.2 Demonstrate ability to conduct independent research correctly while abiding to ethical and safety standards
AREA	Analytical	1.5	E	CHEM 630				
				CHEM 631				
				CHEM 633				
				CHEM 635				
				CHEM 636				
				CHEM 637				
	Physical	3.0	C	CHEM 510				
				CHEM 511				
			E	CHEM 512				
				CHEM 691				
	Organic	3.0	C	CHEM 504				
				CHEM 604				
				CHEB 601				
		E	CHEB 602					
			CHEM 506					
	1.5		CHEM 606					
Inorganic	3.0	C	CHEM 520					
	1.5	E	CHEM 622					
Seminar & Writing	1.0		CHEM 690					
			CHEM 692					
			CHEM 698					
	3.0		CHEM 699					
Ethics & Professional development	1.0		CHEM 693					
	3.0		CHEM 696					
*Dissertation	1.0-10		CHEM 697					
	9.0		*HUMS 701					
*CUMULATIVE EXAMS								
*ORAL CANDIDACY EXAM								
THESIS DEFENSE								

C = Core, E = Elective; †Only for PhD candidates; *Only for PhD students

*Minimum dissertation credits for PhD = 32 of CHEM 697, or 32 of CHEM 697 + HUMS 701

*Minimum credits of CHEM 697 for MS-thesis = 9; for MS-non-thesis = 6

PhD = 9 C + 9 E = 18 didactic courses minimum

MS-thesis = 9 C + 6 E = 15 didactic courses minimum; MS-non-thesis = 9 C + 9 E = 18 didactic courses minimum

**Request For Travel Funds
From Graduate Student Travel Program**

Name _____ Date _____

Meeting _____

Dates of Meeting _____

Location of Meeting _____

Title of Paper _____

Authors _____

Type of Presentation (oral, poster, etc.) _____

Amount Requested (\$400 maximum during student's career) _____

APPROVAL

Research Advisor _____ Date _____
Signature

Graduate Director _____ Date _____
Signature

***This form must be submitted to the Graduate Director 4-6 weeks in advance of the meeting date**



How to Dispose of Hazardous Waste

If you are using Hazardous Products or Materials, (flammable, corrosive, toxic, reactive) you are more than likely creating hazardous waste that needs to be disposed of properly.



Products with these labels are typically hazardous waste when disposed.

Waste containers need to be compatible with what is being stored inside, especially the LID! A waste container is no good to anyone if the lid is corroded away by the hazardous waste inside

Storing Hazardous Waste

All waste containers need to be stored in some form of secondary containment (bucket, tray) in case of breakage)

While in Secondary Containment, each waste container needs to be labeled with the label below (labels available in Chemistry Stockroom)

Hazardous Waste

Satellite Accumulation Area

Contents _____

Handle with Care !

Flammable
 Corrosive pH__
 Reactive
 Toxic

This does not have to be a complete and de-tailed list of what is inside the waste bottle, just a generic description, (Acidic, Basic, Organic Solvents) just so someone coming in the lab has an idea what is inside if they need to.

Waste bottles and the Secondary Containers need to be kept in a clean, neat, and segregated part of

the hood. They need to be closed when not in use, no funnels left inside the bottles.

Final Labeling of Hazardous Waste,

Make sure the waste is labeled with the final label as seen below (labels available at link below VCU SRM under the forms heading)

<https://srm.vcu.edu/i-want-to-know-about/waste-management/>

HAZARDOUS WASTE

Generator's Name & Department Rodney Lab Ram - Chemistry

Bldg./Floor/Room # Temple/ 1st/ 1022 Date Filled 01/01/2016

Chemical Name(s)	Percent or Volume, pH
<u>Xylene</u>	<u>98%</u>
<u>Hydrochloric Acid</u>	<u>1%</u>
<u>Giemsa stain</u>	<u>1% pH 7.0</u>

Make Sure the label is filled out with the Name of the Generator
Department
Building/Floor/Room Number
Date it was filled
Chemical Contents (NO ABBREVIATIONS)

Scheduling a Waste Pickup

Once all this filled out and taped securely on-to the waste bottle, visit the website below and follow the prompts for scheduling a pickup through VCU SRM

<https://redcap.vcu.edu/surveys/?s=CNF7FWH4LE>
All this information applies for both solid and liquid hazardous wast



CLOSE OUT PLAN FORM WHEN SWITCHING ADVISOR

Current Advisor name and signature:

_____ Date _____

Student Name and signature:

_____ Date _____

Chair Name and signature:

_____ Date _____

ACTIVITY PLAN

Date to be completed _____ (no later than 4 weeks from the date above)

VERIFICATION OF COMPLETION SIGNATURES

Current Advisor:

_____ Date _____

Student:

_____ Date _____

Chair:

_____ Date _____