

# Virginia Commonwealth University

## Department of Chemistry



# VCU

## 2025-2026

### Graduate Studies Handbook

DEPARTMENT OF CHEMISTRY  
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Dear Graduate Students:

Welcome to the graduate program of the Chemistry Department at Virginia Commonwealth University. I am confident that the education you will obtain at VCU will prepare you for your professional career. I am also positive that 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 will find this information useful as you prepare to enter the program and 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,

*Soma Dhakal*

Soma Dhakal  
sndhakal@vcu.edu  
Graduate Program Director

## Chemistry Directory

**Chair:** Maryanne M. Collinson

**Associate Chair:** Suzanne Ruder

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FISCAL Office Copier Room	(804) 827-0248 (FAX)	2050	OLVPH	NONE
STOCKROOM	(804) 828-7501	3054	OLVPH	NONE
COMPUTER LAB	NO PHONE	3303	TEMPL	NONE
CGSO (Grad Student Organization)	NO PHONE			President:
Humanities & Sciences Tech (HASTECH)	(804)828-6180	210	STEM	hastech@vcu.edu
Media Support Services	(804)828-1098		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 and manages TA concerns
- Manages grade appeals

### Graduate Program Director, Dr. Soma Dhakal

- 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

### Graduate Admissions Director, Dr. Xuewei Wang

- Corresponds with prospective graduate students
- Handles graduate student admissions

### Graduate Recruitment Director, Dr. Brian Fuglestad

- Corresponds with prospective graduate students
- Plans recruitment events

### Assistant to Departmental Administration, Jason Fish

- Undergraduate student matters: change of grades, overrides
- Course scheduling
- Coordinates student hourly staff
- Faculty searches, some department events, and copy machine and poster printing

### Administrative Assistant, Rhea Miller

- Graduate student forms, VCU Compact Google sheet
- Seminar and some department events
- Keys, Poster printing, and 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 and helpful resource to graduate students

### Stockroom Manager, Michael Morris

- Shipping & Receiving
- Teaching Labs – Supplies, preparation, 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, College of Humanities and Sciences: [CHSfinance@vcu.edu](mailto:CHSfinance@vcu.edu) and finance dashboard:

<https://intranet.chs.vcu.edu/chs-offices/finance/>

- Travel and Personal Reimbursements
- Orders
- generic email for general questions: [CHSfinance@vcu.edu](mailto:CHSfinance@vcu.edu)
- Use the CHS finance dashboard: orders, reimbursements, and travel preapprovals

### Human Resource Coordinator, College of Humanities and Sciences (Chemistry): Donna Ruff

- Personnel - 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 (CHS) and the Graduate School at VCU. An overview of expectations of a graduate student and research advisor established by the VCU College of Humanities and Sciences can be found in the Graduate Compact (<https://graduate.vcu.edu/media/graduate-school-2021/docs/VCUCompactbetweenGraduateStudentsandtheirThesis-DissertationAdvisors.pdf>). This compact is reviewed annually and signed by both the mentor and mentee and is catalogued by the advisors on the Google sheet maintained by the department administrative assistant. The compact should be undertaken by all students working in the department of chemistry (PhD, MS thesis, MS non-thesis). If you have any questions, please check with the Graduate Program 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/>. Questions should be addressed to the Chair and/or Graduate Program Director, Department of Chemistry, 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). Part-time option for PhD in Chemistry is also available if the applicant receives endorsement from a research advisor within the department, however, students need to secure funding as VCU does not offer financial support for the part-time PhD students. The degree of MS is offered in thesis and non-thesis tracks. An appointment as a Lab teaching assistant (LTA) may be available after enrolling in the MS program. An LTA position will provide a stipend based on the number of credits assigned to teach every semester, as warranted by student enrollment in chemistry courses. However, it will not provide any tuition and fee support. Interested MS students should contact the associate chair of the department well before the start of the semester for more information about this opportunity. 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 a 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) start on August 10<sup>th</sup> or January 10<sup>th</sup>. The contract for summer is offered separately and it may be available through GRA (from the advisor's grant) or GTA when teaching during summer. This entails a reduced teaching load with a correspondingly lower stipend than a regular semester GTA. Students should note that the summer stipend is NOT paid before beginning the actual work, which means that if a student is teaching late in summer, no stipend is paid until then. Therefore, students are encouraged to plan their finances accordingly. 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 VCU master's degree and continues with the same research advisor 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  $\geq 3.0$  (B, without rounding up) making timely progress while registering 9-15 graduate credits per semester. GRAs are allowed to register for 1 credit of dissertation credits (CHEM 697) per semester but only after becoming PhD candidates in the 4<sup>th</sup> semester and with approval from the research advisor. **Financial assistance ceases when a PhD Student transfers to MS.** (Graduate Bulletin <http://bulletin.vcu.edu/academic-regs/grad/>)

## B1. GTA

GTA support is provided by the department and may be renewed each year for **up to 5 years**. Students with a 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. Graduate students serving in GTA positions are important members of the academic community in the Chemistry Department. As such, GTAs are expected to maintain a professional relationship with all students at all times, follow the VCU code of conduct (<https://acs.vcu.edu/university-code-of-conduct/>) and 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/>).

### GTA Assignments and Responsibilities

A graduate teaching assistant contract is a 20-hour/week contract. 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. 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. ([Employee-Student Consensual Relationships Policy](#))
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](#)

In addition to the University policies above, all GTAs must adhere to the following guidelines which help ensure a productive and safe learning environment. Failure to abide by these responsibilities could result in the termination of your GTA appointment.

#### *Professional Development and Compliance*

- Successfully complete the self-paced GTA orientation (on Canvas) offered by the graduate school.
- Participate in the VCU Title IX seminar each Fall semester until graduation.
- Adhere to all university and Chemistry department guidelines including those related to chemical hygiene and safety protocols outlined in the Chemical Hygiene and Safety Regulations.
- Foster a respectful environment: Show respect to all co-workers, laboratory personnel, and office staff.
- Participate in TA training each Fall semester, or prior to first semester as a GTA.

#### *Classroom and Laboratory Conduct*

- Safety enforcement: **Strictly enforce all safety protocols** as defined by the course instructor and university. Ensure students wear required safety equipment (e.g. goggles) and adhere to dress codes (e.g. wearing pants). Failure to uphold safety protocols may result in the termination of your position.
- Punctuality: Arrive at your assigned class or lab **at least 5 minutes** early or as designated by the course instructor. Before class, verify that all necessary materials and equipment are available in the lab.
- Maintain Professional Boundaries: Do not engage in personal relationships (e.g. dating, flirting, socializing) with students in your classes. Your role is that of a mentor and teacher; any relationship beyond a professional one



compromises this dynamic and violates university policy, potentially leading to job termination and reputational damage.

- Professional Communication: Exercise caution and good judgment when making jokes or comments. Avoid any remarks that could be perceived as biased or insensitive. Inappropriate comments can have serious consequences including the termination of your GTA position.
- Focused Attention: During class or lab time, your complete attention must be on your students and teaching responsibilities. Avoid distractions such as personal classwork, phone use, or engaging with friends.
- Laboratory Maintenance: Leave laboratories clean and organized at the end of each session. Report any equipment or room issues to the chemical stockroom personnel.
- Student Engagement: Engage with your students during laboratory sessions and be prepared to answer questions.

#### *Academic & Administrative Duties*

- Understand Course Material: Thoroughly **understand** the material to be covered in each lab session, including practical application to the lab, and its relation to the lectures.
- Maintain Records: Accurately maintain course attendance and grade records in accordance with Chemistry Department guidelines and the faculty instructor's directions.
- Timely Communication: Respond to all emails quickly and efficiently. Let students know when you are available to help them outside of the laboratory.
- Meeting Attendance: Attend **all** scheduled course staff meetings and grading sessions and proctor scheduled exams.
- Grading and Feedback: Accurately and fairly grade quizzes, laboratory reports, and assignments following the guidelines provided by the faculty instructor. **Return graded assignments at the next laboratory session** unless otherwise indicated. Submit final laboratory grades by the deadline designated by the faculty instructor.
- Course issues: Promptly relay any problems encountered with the experiments or laboratory sessions to the supervising faculty member.
- Availability: Remain available until final grades for your course have been assigned or as otherwise defined by the faculty instructor.

#### **In the event of an absence**

A graduate teaching assistant (GTA) must notify **both** the Associate Chair and the instructor of the course if he/she is planning to be absent from any class or laboratory session as soon as possible. It is the responsibility of the GTA to arrange a substitute for each class session and notify the instructor of the course and the associate chair who the replacement will be before it begins. The course instructor and/or associate chair will grant or deny the request. For emergency absences, the GTA must notify the instructor of the course and cc the associate chair as soon as possible. If possible, the GTA should find a substitute; if this is not possible, the Associate Chair/Course instructor will assist.

#### **B2. GRAs**

GRAs perform research for advisors who are Principal Investigators (PIs) pursuing funded research programs. Students with a GRA contract are expected to work in the advisor's laboratory to conduct research as defined by the faculty advisor. The renewal of the 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 4<sup>th</sup> semester) at the discretion of the PI and the availability of research grants.

#### **B3. Fellowships and Scholarships**

Students with strong academic backgrounds are encouraged to consider applying for National Scholarships and Fellowships. The National Scholarship Office (NSO) offers a range of services to VCU students and alumni who are interested in applying for competitive national and international scholarships and fellowships. <https://nso.vcu.edu/>

Below are examples of some National Fellowships and local scholarships.

- A. **National Science Foundation Graduate Research Fellowship.** "The purpose of the NSF Graduate Research Fellowship Program (GRFP) is to help ensure the quality, vitality, and diversity of the scientific and engineering workforce of the United States. A goal of the program is to broaden participation of the full spectrum of diverse talents in STEM. The five-year fellowship provides three years of financial support inclusive of an annual stipend of \$37,000." <https://www.nsfgrfp.org/>

- B. **Office of Science Graduate Student Research (SCGSR) Program.** (<https://science.osti.gov/wdts/scgsr>). "The DOE Office of Science Graduate Fellowship program (SCGF) has supported outstanding graduate students pursuing graduate training in basic research in areas of physics, biology (non-medical), chemistry, mathematics, engineering, computational and computer sciences, and environmental sciences relevant to the Office of Science mission areas to encourage the development of the next generation of scientific and technical talent in the U.S." <https://science.osti.gov/wdts/scgf>
- C. **Department of Defense SMART scholarships.** <https://www.smartscholarship.org/smart> "The SMART Scholarship-for-Service Program is a combined educational and workforce development opportunity for STEM students. SMART offers scholarships for undergraduate, master's, and doctoral students pursuing a STEM degree. Scholarship recipients receive full tuition, annual stipends, internships, and guaranteed employment with the Department of Defense after graduation." <https://www.smartscholarship.org/smart>
- D. **American Chemical Society (ACS) Graduate Scholarships** "ACS offers grants to support the advancement of the chemical sciences through research, education, and community projects." Travel awards are also available. <https://www.acs.org/education/students/graduate/scholarships.html>
- E. **American Chemical Society (ACS) Graduate Analytical Scholarships.** "The American Chemical Society Division of Analytical Chemistry Graduate Fellowship Program is designed to encourage basic research in the field of analytical chemistry, to promote the growth of analytical chemistry in academic institutions and industry, and to provide recognition of future leaders in the field of analytical chemistry." <https://acsanalytical.org/graduate-student-fellowships/>
- F. **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/departamental-scholarships/>. Students must apply through the Rams Scholarship Hub (typically) in the Spring semester. <https://vcu.academicworks.com/>

#### 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, 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 questions 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  $\geq 3.0$  (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 4<sup>th</sup> 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 4<sup>th</sup> 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 4<sup>th</sup> 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 the 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/rcf-full-time/> 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 a 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.

### Summary: CHEM 697 vs HUMS 701

Questions to ask yourself:

1. Are you on a Visa? You must get approval from Global Education Office (GEO) as described earlier
2. Do you have student loans? Part-time status could trigger the re-payment of student loans
3. FICA-Medicare: FICA and Medicare taxes are withheld from each paycheck (exemptions apply only to full-time students).
4. Do you need Health Insurance? Part-time domestic students are not eligible for the VCU health insurance program. International students on a F- or J- visa ARE eligible for the VCU health insurance program (they pay 100%)
5. Does it align with the number of credits needed to graduate in time?”

### E. Proficiency Examinations for CHEM and CHEM PHYS Students

Students entering the CHEM and CHEM PHYS graduate program are required to demonstrate proficiency in the subject matter that they are going to teach in their first year. The proficiency exam is given during orientation week. These exams assess whether students have mastered core concepts expected in their field of study. This helps ensure that all students, regardless of their undergraduate background, are starting from a common academic foundation. It will also ensure students have the necessary subject mastery to teach undergraduate students. Proficiency will be tested using the relevant American Chemical Society (ACS) standardized test exam (General Chemistry OR Organic Chemistry) and each student should obtain at least a passing score (a score of 39 out of 70). For those who are unable to obtain a passing score will be required to attend relevant course lecture(s), followed by a retake of the exam at the end of second semester. Students who cannot obtain a passing score in this second attempt will, unfortunately, be unable to continue with a teaching assistantship (TA) position in the department. It is thus highly recommended to review and study the necessary materials for this exam. The results of these exams have no bearing on students' transcripts. **Students entering the PhD programs in CHEM and NANO are not required to take this proficiency exam.**

### F. Limits on Course Load and Continuous Enrollment

To be eligible for an 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 4<sup>th</sup> semester, students must register for 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 6 years for a MS degree. Even after the 10<sup>th</sup> semester when no GTA support is available, a student who continues in the program must register for at least 1 credit per semester (CHEM 697) to maintain continuous enrollment unless a leave of absence (LOA) is requested. Students must also register for at least 1 credit in the summer if they plan to graduate.**

<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 without rounding) 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 3.0 (without rounding up) or a graduate course graded D or F. Likewise, students who receive 2 unsatisfactory grades “U” in**

dissemination courses (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 a research advisor (by October 31<sup>st</sup> when entering in the Fall or March 31<sup>st</sup> when entering in the Spring), they are expected to start going to the research labs to get acquainted with project techniques and associated literature, and initiate training with senior members. Upon completing courses (1<sup>st</sup> 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 3.0 (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 the student after one semester
- Two U-grades (unsatisfactory) in CHEM 697 or HUMS 701
- Not passing the Oral Candidacy Exam by the end of the 4<sup>th</sup> 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 primarily 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 the 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 Program 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 Program Director submits a Special Action Form (SAF) to the dean's office on the 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 Program 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 committee is made up of 5 faculty, one from each of the four chemistry areas, in addition to the Graduate Program Director who acts as committee chair. At discretion of the Department Chair, membership to this committee rotates yearly among departmental Pls. 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. It is in the best interest of the committee to follow the handbook rules, however, when deemed necessary, the committee in coordination with the department chair may make exceptions to the handbook policy on a case-by-case basis.

#### C. Graduate Program Director (GPD)

The GPD 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 Program Director coordinates orientation week for new graduate students and the execution and grading of proficiency exams. The GDP also coordinates the annual program assessment in collaboration with the Department Chair, the GEAC, and the Graduate Administrative Assistant.

#### D. Graduate Administrative Assistant

The Graduate Administrative Assistant provides 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, and scheduling of visiting speakers and graduate students.

#### E. Financial Manager

The Financial Manager handles and oversees financial matters pertaining to 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 accordance with VCU's mission. Students must comply with these guidelines to prevent the 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 written communication skills
- Demonstrate ability to analyze data critically in chemistry
- Demonstrate ability to conduct independent research correctly while abiding by 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-reviewed 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 10<sup>th</sup> semester, therefore students are encouraged to follow the registration timeline outlined in Table 1.** This includes completing the pre-candidacy requirements of courses, literature seminars, and oral candidacy exams, 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 a 10-semester timeline for a full-time PhD in Chemistry. The numbers in parentheses represent the number of credits.

PRE-CANDIDACY 9 to 15 CREDITS/SEMESTER ENTERING IN FALL					
Semester 1		Semester 2		Semester 3	
Elective Courses (9) Chem 690 (1) CHEM 693 (1) CHEM 697 (4)  Advisor selection by Oct 15 <sup>a</sup> Committee selection by the end of semester 1 <sup>b</sup>		Elective courses (9) CHEM 690 (1) CHEM 697 (4) CHEM 698 (1)		CHEM 692 (1) CHEM 697 (11) CHEM 699 (3)  LITERATURE SEMINAR	
15 credits		15 credits		10 credits	
PRE-CANDIDACY 9 to 15 CREDITS/SEMESTER ENTERING IN SPRING					
Semester 1		Semester 2		Semester 3	
Elective courses (9) CHEM 690 (1) CHEM 697 (4) CHEM 698 (1)  Advisor selection by March 15 <sup>a</sup>		Elective Courses (9) CHEM 690 (1) CHEM 693 (1) CHEM 697 (4)		CHEM 692 (1) CHEM 697 (14)  LITERATURE SEMINAR	
15 credits		15 credits		10 credits	
POST-CANDIDACY 9 CREDITS/SEMESTER					
Semester 5		Semester 6		Semester 7	
HUMS 701 <sup>d</sup>		HUMS 701 <sup>d</sup>		HUMS 701 <sup>d</sup>	
9 credits		9 credits		9 credits	
Semester 8		Semester 9		Semester 10	
HUMS 701 <sup>d</sup>		HUMS 701 <sup>d</sup>		HUMS 701 <sup>d</sup> -RESEARCH SEMINAR -THESIS DEFENSE	
9 credits		9 credits		9 credits	

<sup>a</sup>Obtain Chair's approval and <sup>b</sup>notify Graduate Program Director and Administrative Assistant. <sup>c</sup>Dismissal or transfer to MS will ensue if not completed by the end of the 4<sup>th</sup> semester. <sup>d</sup>It 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 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). The course in Scientific Writing in Chemistry (CHEM 699) should be taken in either the third or fourth semester (see Table 1).

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 credits required, out of which 30 credits are required at the 600-level or higher)

Course	Credits	Semester Offered (when to complete it)
Electives from Table 3	18	Some in Fall, some in Spring (1 <sup>st</sup> year)
CHEM 693 Chemistry Perspectives and Ethics	1	Fall (1 <sup>st</sup> 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 <sup>a</sup>	1 (1 time)	Fall and Spring (only in pre-candidacy)
CHEM 699 Scientific Writing in Chemistry	3	Fall (1 <sup>st</sup> or 2 <sup>nd</sup> year prior to candidacy exam)
CHEM 697 Directed Research	33	Fall and Spring (pre- and post-candidacy)

Dissertation Courses	HUMS 701 Post-candidacy Doctoral Research.		Fall and Spring (only in post-candidacy)
<b>Other Requirements</b>			
Oral Candidacy Exam			Fall, Spring or Summer (4 <sup>th</sup> semester)
Application to Candidacy			4 <sup>th</sup> semester (immediately passing candidacy exam)
Research Seminar to the department			Graduation semester or one semester before graduation
Thesis manuscript (3-7 chapters) and final defense			Graduation semester
Electronic Thesis upload and Application Graduation			Graduation semester upon final defense

<sup>a</sup>Students 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 Elective Courses\*

	AREA OR TOPIC	COURSE	NAME	CREDITS	Most likely SEMESTER
DIDACTIC	ANALYTICAL	CHEM 630	Electroanalytical Chemistry	1.5	Spring
		CHEM 631	Separation Science	1.5	Fall
		CHEM 633	Mass Spectrometry	1.5	Fall
		CHEM 635	Spectrochemical Analysis	1.5	Fall
		CHEM 636	Chemical Sensors & Biosensors	1.5	Spring
		CHEM 637	Electrochemistry Applications	1.5	Spring
	INORGANIC	CHEM 520	Advanced Inorganic	3	Fall
		CHEM 622	Solid State & Materials	1.5	Spring
		CHEM 591	Redox Chemistry	1.5	Fall
	ORGANIC	CHEM 504	Advanced Organic I	3	Fall
		CHEM 604	Advanced Organic II	3	Spring
		CHEM 506	Introduction to Spectroscopic Methods	1.5	Spring
		CHEM 606	Advanced Spectroscopic Methods	1.5	Spring
		CHEB 601	Chemical Biology I	3	Fall
		CHEB 602	Chemical Biology II	3	Spring
	PHYSICAL	CHEM 591	Biophysical mthds & principles	3	Fuglestad
		CHEM 510	Atomic and Molecular Structure	3	Fall
		CHEM 511	Chemical Thermodynamics and Kinetics	3	Spring
		CHEM 512	Applied Molecular Modeling	3	Spring
	OTHER	CHEM 691	Nanomaterials Energy & Environ Applications	3	Spring
	EDUCATION RESEARCH	CHEM 591	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 the advisor. Sections of CHEM 697 with a variable number of credits are offered every semester to facilitate reaching the number of credits needed. Candidates supported on GTA or any other fellowships must register HUMS 701 without exception.

### C. Course Transfers, Waivers, and Optional Undergraduate Courses

Students can request transfers in the form of **waivers** (up to 6 credits maximum) for the graduate level courses taken at previous institutions or VCU by emailing the Graduate Program Director attaching the syllabus of the course taken previously along with the unofficial transcript, and the course at VCU to be waived. Once the content is verified to be equivalent to the VCU course by the corresponding departmental division, the Graduate Program Director files a waiver request with the College, filling out an online [form](#), which typically takes 3 weeks for approval to appear in the student's 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 the graduate GPA.

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

During the four semesters of pre-candidacy, Ph.D. students are required to register for 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://viriniacommonwealth.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 (3<sup>rd</sup> or 4<sup>th</sup> 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 the 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 the 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 from going below B.

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

- The topic cannot have a direct overlap with the student's research.
- It cannot include published work by the student's advisor, collaborators, or others doing similar work.
- 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 Form

		Does not Meet	Meets	Exceeds
	Score	1 to 6	7 to 8	9 to 10
<b>Organization</b>				
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				
<b>Delivery</b>				
5. Ability to hold the audience's attention				
6. Ability to stay within the required time (40-50 mins excluding questions)				
<b>Questions</b>				
7. Ability to grasp material presented				
8. Depth of understanding of the topic and relevant background material				
<b>Other</b>				
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.)				
<b>TOTAL/100 PTS</b> (Combined score by committee)				

#### E. 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 4<sup>th</sup> 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 committee 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/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](mailto: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 before the scheduled defense. Failure to do so can result in the rescheduling of the defense.

##### **Requirements:**

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). 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. These are summarized below:

In your proposal, you will need to identify the problem, describe the knowledge gap, and then describe solutions to the problem that includes your work to date and future work (proposed work). It is highly recommended to include the following sections:

- **Title:** A concise title to communicate the main research questions

- **Abstract:** Short overview of the scientific problem and the work to be done
- **Introduction:** An overview of the research topic, its significance, and the research problem or questions. A good introduction will create an interest in the readers about the topic and the proposal.
- **Background:** A critical assessment of related research that provides a rationale for the research project. The significance of the proposed work should become apparent in this section.
- **Objectives/Specific aims:** An explanation of the research's objectives and what the researcher intends to achieve or aim to answer. Typically, its one page (singled space).
- **Preliminary results:** Research done to date. Include methodology as needed; include figures and equations as needed. Figures are added after the point at which they are first mentioned in the text. Please embed them in the text and consider wrapping the text around it to save room.
- **Proposed research.** A detailed description of experiments that will be done, how the data will be collected, analyzed, and the specific aims/objectives answered. Include procedures, techniques, expected results, etc. Should be at least 4-5 pages (single spaced)
- **Limitations and concerns** (optional)
- **Summary and concluding paragraph.** Keep it short. Highlight how you will answer the scientific questions proposed earlier.
- **References:** Follow the Journal of the American Chemical Society (ACS) and include titles. A minimum of 25 references must be cited with no more than 30% citations from the student's research group. Typically, in a proposal, 50-100 references are cited. It is highly recommended that a reference manager software be used (free version: Zotero, Mendeley; paid version: Endnote)
- **Figures, schemes and equations** must be numbered and **embedded** in the section of text where they are described. Figure captions should be descriptive. The font size can be 10 pt in the figure caption, but not smaller. Make sure figures have legible font sizes.
- **Spell check and use a grammar checker as needed.**

#### Evaluation.

**Table 5.** Grading of Student Learning Outcomes (Defense Evaluation)

		Score	Does not Meet 1 to 6	Meets 7 to 8	Exceeds 9 to 10
<b>SLO</b>					
1. Demonstrate breadth and depth in their field of research					
2. Demonstrate effective oral and writing communication skills in their field of research	Oral presentation				
	Candidacy/Thesis manuscript				
3. Demonstrate ability to analyze data critically					
4. Demonstrate ability to <b>conduct independent research</b> correctly while abiding to ethical and safety standards	Project progress				
<b>TOTAL</b>					

On the day of the defense, the examination begins with the student giving a **30-minute presentation** summarizing the major points of the dissertation work 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 minimum total score of 35 or above represents a satisfactory passing result.** However, despite passing the exam, an unmet score ( $\leq 6$ ) 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 the 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 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 4<sup>th</sup> year committee update in the 8<sup>th</sup> 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 improving 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.**

#### F. PhD Committee Update (4<sup>th</sup> year)

All PhD students must present a committee update during their 8<sup>th</sup> semester. This update will consist of an oral presentation to the committee on the dissertation work 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 have 1-inch margin on all sides, 11 font arial, with no more than 15 references in the bibliography. This committee update requirement is enforced by the Graduate Program Director and graded by the committee using the same rubric as 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 the 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.

#### G. 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 the regular schedule (Tuesdays or Thursdays 4:00 to 5:00 pm) or get permission from the professor in charge of the seminar program when presenting at a different time. In the latter case, students must secure room reservation with the Graduate Administrative Assistant. Students should send a reminder email of their seminar to the committee soon after scheduling them and the day before the seminar. Note that the performance is assessed with the evaluation form used for the Literature Seminar (Section 3E) but the grade will not appear in the transcript, therefore, **PhD students must not register CHEM 692 for this seminar.**

#### H. Final Dissertation Defense

Every student is expected to complete an original research project(s) 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 the preparation of the thesis can be found in the Graduate Dissertation Manual:

<https://graduate.vcu.edu/media/graduate-school-2021/docs/ETDManualApril2023-FINAL.pdf>

When advisor and student collectively determine that sufficient research has been completed to write a **dissertation of 3 to 7 chapters (~3 to 5 research articles typically in addition to a detailed and relevant introduction and background sections 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. Electronic copies of the dissertation should be made available to the committee two weeks before the defense. Failure to do so can result in rescheduling of the defense.

**Given that the PhD is awarded for addressing an original problem in research, evidence of publication (at least one manuscript submitted) in a peer-reviewed 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. Most advisors have more stringent requirements, such as requiring a certain number of published papers or specifying that some must be in higher-impact journals. Therefore, students are urged to have open conversations with their research advisor to discuss these expectations ahead of time.

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. Application to Graduation

During the first week of the semester of graduation, students must declare intent to graduate on e-services after talking to their research advisor. Concurrently, they also need to schedule their thesis defense and research seminar (section 3G) 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 the 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 initiate DocuSign form available on the

graduate school webpage <https://graduate.vcu.edu/current-students/electronic-thesis-and-dissertation/>. This will start the automated signing by the committee members, Graduate Program Director, and corresponding associate dean. Students should also apply for graduation following the university instructions: <https://rar.vcu.edu/graduation/graduation-application/>. 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 to attend 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. 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 credits required, out of which 15 credits required at the 600-level or higher)

Course Requirement		Credits		Semester offered (when to take it)
		Thesis	Non-Thesis	
CHEM 504 Advanced Organic Chemistry	Area core courses	3	3	Fall (1 <sup>st</sup> year)
CHEM 510 Atomic and Molecular Structure		3	3	
CHEM 520 Advanced Inorganic Chemistry		3	3	
CHEM 693 Chemistry Perspectives and Ethics		1	1	
Electives from Table 3		6	9	Fall and Spring (1 <sup>st</sup> year)
CHEM 696 Professional Skill Development		3	3	Fall (1 <sup>st</sup> year)
CHEM 698 Investigation in Current Chemistry Literature		1	1	Fall and Spring (1 <sup>st</sup> year)
CHEM 692 Seminar Presentation to committee		1	1	Graduation semester
CHEM 697 Directed Research		9	6	Throughout the degree
<b>Other Requirements</b>				
Application to Candidacy		yes	yes	After defense/report to committee
Thesis (1-2 chapters) with defense to committee		yes	no	Graduation semester
Project Report (7-10 pages) with Q&A to committee		no	yes	Graduation semester
Application for Graduation		yes	yes	After passing defense

<sup>a</sup>This 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 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 6 years. MS students must also take the proficiency exam in General Chemistry during orientation week and the results should guide the selections of elective courses to alleviate weaknesses disclosed in the exam. **PhD students can transfer to MS** after emailing a formal request to the Graduate Program 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 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 the deadline listed on the VCU calendar.

**Table 7.** Example of 4-semester timeline for **MS CHEM Thesis Option** (30 credits required, out of which 15 credits required at the 600-level or higher)

Semester 1	Semester 2	Semester 3	Semester 4
Core: CHEM 504, 510, 520 (9) CHEM 693 (1)  Advisor selection by Oct 15 (Fall start) or March 15 (Spring start) <sup>a</sup> Committee selection by the end of semester 1 <sup>b</sup>	Elective courses (6) CHEM 698 (1) CHEM 696 (3)	CHEM 697 (5)	CHEM 692 (1) CHEM 697 (4)  -RESEARCH SEMINAR (40-45 min) and 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 credits required, out of which 15 credits required at the 600-level or higher)

Semester 1	Semester 2	Semester 3	Semester 4
Core: CHEM 504, 510, 520 (9) CHEM 693 (1)  Advisor selection by Oct 15 (Fall start) or March 15 (Spring start) <sup>a</sup> Committee selection by the end of semester 1 <sup>b</sup>	Elective courses (9) CHEM 698 (1) CHEM 696 (3)	CHEM 697 (3)	CHEM 692 (1) CHEM 697 (3)  -RESEARCH SEMINAR (40-45 min) and Q&A TO COMMITTEE
10 credits	13 credits	3 credits	4 credits

<sup>a</sup>Students commencing in Fall or Spring must get approved by Department Chair's approval and <sup>b</sup>notify Graduate Program Director and Administrative Assistant.

The non-thesis option also requires an advisor in the department, but co-advisors in other departments, industrial or government labs are also allowed. A research project of an 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 in an internship at the site of employment or in a PI's lab at VCU.

If a student on a thesis-track wishes to change to a non-thesis track, the student should email the graduate program director and cc the research advisor, requesting such a switch at the beginning of their graduation semester at the latest. The graduate program director then submits a request to the graduate school for approval. Once approved by the graduate school, the student's degree works gets updated to the non-thesis option.

#### B. Research Seminar Presentation to Committee (CHEM 692) – Both Thesis and Non-Thesis Tracks

In the semester of graduation, MS students in the thesis and non-thesis tracks must register for CHEM 692 to be graded with a seminar presentation (40-45 min) of their lab work to their committee. **Note that the seminar presentation and defense are done as one event for MS students. See section 5D and 5F below for information about defense.** The seminar is graded by the committee using the letter scale A to F with the rubric provided in the Appendix and the grade must be communicated to the Graduate Administrative Assistant and the Professor in charge of CHEM 692 by the committee chair. The student should email the title and date of the seminar to the Graduate Administrative Assistant to reserve a room and have the grading rubric sent to the committee. Students should also email the seminar abstract to the committee a week before the seminar date. Students should practice the talk at least once in front of an advisor and other students. 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 seminar and the Q&A session, each committee member evaluates the performance using the rubric in Table 4. In this scoring system, 100 to 85 is equivalent to A, 84 to 70 is B, and anything below 70 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 the 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 the 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 have an A in another course to prevent the GPA from going below 3.0 without rounding.

### C. MS Candidacy Application – Both Thesis and Non-Thesis Tracks

Both MS-thesis and non-thesis students are required to apply for degree candidacy with the graduate school. This process is done during the semester of graduation after discussions with their research advisor. Before applying for candidacy, MS-thesis students should complete courses (30 total credits minimum, which includes 9 credits of directed research), give a research seminar to the committee, submit a thesis, and do the final defense to the committee (see Section 5D below for more information). Similarly, MS non-thesis students should complete courses (30 total credits minimum, which includes 6 credits of directed research, give a research seminar to the committee, submit a Project report, and do the Q&A to the committee (see Section 5F below for more information). Students should initiate the candidacy application via DocuSign on the graduate school website at <https://graduate.vcu.edu/current-students/degree-candidacy/> including names and emails of the major advisor, Graduate Program Director, and corresponding associate dean. Instructions are provided on the website.

### D. Final Defense and Application to Graduation – 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 with the committee 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 the 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 (see Section 5C above). 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. Research Report and Application to Graduation – non-Thesis Track

Students on the MS non-thesis track need to write a final report of 7 to 10 pages (including figures, but excluding the title page and references) at single space in font size 11 (Arial, Helvetica or Palatino linotype) and 1-inch margin on all sides. This report is about experimental and/or theoretical work conducted by the student on learning a technique, investigating a chemical problem, or doing data analysis under the guidance of an 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. Failure to do so can result in the rescheduling of the exam. 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 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 the 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 e-services 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. Title IX Training**

Regardless of your appointment such as a GTA, GRA or LTA, you must attend the seminar by VCU Title IX office during the orientation week each Fall and annually thereafter (unless otherwise noted) until you graduate. The format and schedule of

seminar will be communicated via email. Not being able to attend the seminar may lead to administrative action up to losing the GTA/GRA/LTA position. Note that this is NOT a replacement of the required “Not Anymore” online training.

## 7. Course Registration

To register online, go to [www.vcu.edu](http://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 on a particular course, you can determine its CRN, instructor, seats 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 for the course but the professor in charge of CHEM 690/692 needs to be informed that your attendance at 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 Program Director to authorize an override.

Typically, students devote the first and second semesters to satisfy core courses and electives. 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 3<sup>rd</sup> semester. The same goal applies to MS students. Students must never register for summer credits unless graduating on a summer period, in which case they must register for 1 credit of CHEM 697. However, charges will apply to the student or advisor’s grant.

## 8. 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 by the Dean’s office through the Graduate Program Director. A compelling reason must be added to the request, whose approval remains at the discretion of the Associate Dean of the College.

## 9. 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 host 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 an 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 the 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? How many publications are needed?
- 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 their 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 who is currently growing their 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 their 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 2<sup>nd</sup> and 3<sup>rd</sup> 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 the Department Poster Session and talk to your fellow graduate students
3. Meet individually with faculty
4. Have three choices for an advisor
5. Meet with the 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 by October 31.
7. Notify the Graduate Program 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 are expected to obtain selection approval from the Department Chair **no later than October 15 (entering in Fall) or March 15 (entering in Spring)**. A "U" grade in CHEM 697 will be assigned if this deadline is not met. **Please do not delay.**

#### **10. 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 10<sup>th</sup> semester, regardless of the time of switching. Advisor change is highly discouraged for post-candidacy students due to the limited time they have to complete the degree. For student-driven requests, the post-candidacy students need to redo their candidacy in a new project within 2 semesters after switching the lab. Therefore, the department encourages as a first option, for the 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 Program Director and discuss the situation. If the student works in the Graduate Program Director's research group, the student needs to meet with the Chair of the Department. The Graduate Program 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 Program 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 Program 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 Program Director to discuss the situation, if so desired. Ultimately, the Graduate Program 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 Program Director, options (1) or (2) above may also be taken depending on the case.



**In any change scenario**, requested by the 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 the 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 by the new advisor, along with the assembly of a new thesis committee. The student must submit all signed forms (digital or printout) and names of the new thesis committee to the graduate administrative assistant.

#### 11. 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.**

#### 12. Graduate Poster Session

All graduate students except those in the MS-non thesis track or who have not selected an 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 their 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 the Graduate Administrative Assistant's instructions for printing posters and presentation scheduling.

#### 13. Support for Graduate Student Travel

Students can apply for travel support (up to \$500) 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 Program Director and Department Chair. Subsequently, students must email the signed form to [chemtravel@vcu.edu](mailto: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:

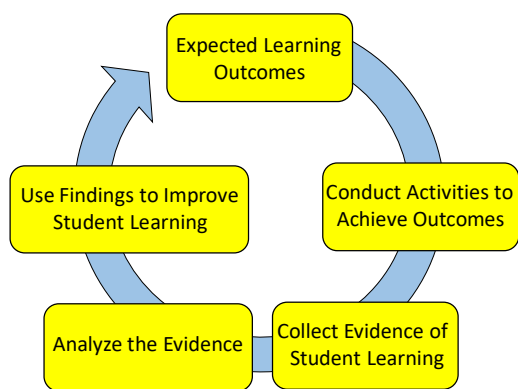
<https://graduate.vcu.edu/current-students/awards-and-competitions/travel-grants/>

#### 14. Career Plans

Beyond acquiring specialized knowledge in chemistry, the 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 to 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.

#### 15. 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://academics.provost.vcu.edu/assessment-accreditation-and-compliance/assessment/platform/>



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 Program 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.

# APPENDIX

## *Important Forms and Rubrics*



### **Acknowledgment of GTA Responsibilities**

By signing below, I acknowledge that I have read, understood, and agree to abide by the Graduate Teaching Assistant Responsibilities outlined in this document.

[Print Name]:

---

[Signature]:

---

[Date, mm/dd/yyyy]:

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## Literature or Research Seminar Approval Form

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 others doing similar work.
- 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 their 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 Chair: \_\_\_\_\_ Department of \_\_\_\_\_

Advisor: \_\_\_\_\_ Department of \_\_\_\_\_

Member: \_\_\_\_\_ Department of \_\_\_\_\_

Member: \_\_\_\_\_ Department of \_\_\_\_\_

Member: \_\_\_\_\_ Department of \_\_\_\_\_

## Literature or Research Seminar Form

Type of Seminar: ☐ Literature Seminar ☐ Research Seminar  
 Student Category: ☐ PhD ☐ MS Thesis ☐ MS Non-thesis

Student's name \_\_\_\_\_ Started in: ☐ FALL ☐ SPRING OF \_\_\_\_\_

Area of Concentration \_\_\_\_\_ Today's date \_\_\_\_\_

### To Research advisor:

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

Names of students present at the seminar practice (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	1 to 6	7 to 8	9 to 10
<b>Organization</b>				
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				
<b>Delivery</b>				
5. Ability to hold the audience's attention				
6. Ability to stay within the required time (40-50 mins excluding questions)				
<b>Questions</b>				
7. Ability to grasp the material presented				
8. Depth of understanding of the topic and relevant background material				
<b>Other</b>				
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)				
<b>*TOTAL/100 PTS</b>				

\*A = 100-85; B = 84-70; C ≤ 69. Students graded C are allowed to repeat the seminar at committee's discretion.

Recommended grade: \_\_\_\_\_

### Comments/Justification:

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 \_\_\_\_\_

## Defense Evaluation Form

TYPE OF EXAM

☐ PhD Committee Update

☐ PhD Oral Candidacy 1<sup>st</sup> Try

☐ PhD Thesis Defense

☐ PhD Oral Candidacy 2<sup>nd</sup> 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  $\geq 35$  to pass (satisfactory). When getting less than 35, 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 4<sup>th</sup> 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 ( $<35$ ) at the second try.

### I. SLO EVALUATION

		*Score	Does not Meet 1 to 6	Meets 7 to 8	Exceeds 9 to 10
<b>SLO</b>					
1. Demonstrate breadth and depth in their field of research					
2. Demonstrate effective oral and writing communication skills in their field of research	Oral presentation				
	Candidacy/Thesis manuscript				
3. Demonstrate ability to analyze data critically					
4. Demonstrate ability to <b>conduct independent research</b> correctly while abiding to ethical and safety standards	Project progress (see Section II)				
		<b>**TOTAL</b>			

\*Despite passing the exam, the committee may give an assignment following a deadline to improve a SLO scoring below 6.

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

In presentations outside VCU: Oral \_\_\_\_\_ Poster \_\_\_\_\_

Or as primary (1<sup>st</sup>) or secondary (2<sup>nd</sup>) 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 10<sup>th</sup> semester? \_\_\_\_\_

### III. THE RESULTS OF THE EXAM:

SATISFACTORY

(PASS)

☐

UNSATISFACTORY

(NO PASS)

☐

Is a second meeting necessary? NO / YES When? \_\_\_\_\_ Reason: UPDATE SLO # \_ \_ 2<sup>nd</sup> 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/research	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	E	C/E CHEM 510					
				CHEM 511					
				CHEM 512					
				CHEM 691					
	Organic	3.0	C/E	CHEM 504					
				E	CHEM 604				
					CHEB 601				
		1.5	E		CHEB 602				
				CHEM 506					
				CHEM 606					
	Inorganic	3.0	C/E	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						
*ORAL CANDIDACY EXAM									
THESIS DEFENSE									

C= Core courses for MS; E = Elective; †Only for PhD candidates

\*Minimum dissertation credits for PhD = 33 of CHEM 697, or 33 of CHEM 697 + HUMS 701

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

PhD = 18 didactic courses minimum

MS-thesis = 9 Core + 6 Electives (15 didactic courses minimum); MS-non-thesis = 9 Core + 9 Electives (18 didactic courses minimum)



## Request for Travel Funds from **Graduate Student Travel Program**

\_\_\_\_\_  
Student Name

\_\_\_\_\_  
Today's Date

\_\_\_\_\_  
Meeting

\_\_\_\_\_  
Meeting Dates

\_\_\_\_\_  
Location of Meeting (City, State, Country)

Title of Paper \_\_\_\_\_

\_\_\_\_\_  
Authors \_\_\_\_\_

\_\_\_\_\_  
Type of Presentation (oral, poster, etc.) \_\_\_\_\_

Amount Requested (\$500 maximum during student's career) \$ \_\_\_\_\_

### APPROVALS:

\_\_\_\_\_  
Research Advisor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Graduate Program Director

\_\_\_\_\_  
Date

**\*This form must be submitted to the Graduate Program 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.



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 _____	
<b>Handle with Care !</b>	
<input type="checkbox"/> Flammable	<input type="checkbox"/> Corrosive pH ____
<input type="checkbox"/> Reactive	<input type="checkbox"/> 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 <u>Rodney Lab Ram - Chemistry</u>	
Bldg./Floor/Room # <u>Temple/ 1<sup>st</sup>/ 1022</u> Date Filled <u>01/01/2016</u>	
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 waste



## RESEARCH ADVISOR SELECTION FORM

Complete, scan and email this form to the Department Chair by October 15<sup>th</sup> (students commencing studies in the fall semester) or March 15<sup>th</sup> (students commencing studies in the spring semester) for official approval. The Graduate Program Director and administrative assistant should be copied on this email.

**Note:** While the department chair does their 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 2<sup>nd</sup> and 3<sup>rd</sup> 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.

### Select program:

\_\_\_\_\_ PhD-CHEM    \_\_\_\_\_ PhD-CHEB    \_\_\_\_\_ PhD-NANO    \_\_\_\_\_ MS-Thesis    \_\_\_\_\_ MS-Non-Thesis

### Research Advisor of Choice:

\_\_\_\_\_  
Advisor's Name

\_\_\_\_\_  
Advisor's signature

\_\_\_\_\_  
Student's Name

\_\_\_\_\_  
Student's signature

### The section below is completed by the department chair:

Dr. \_\_\_\_\_ is approved as advisor for \_\_\_\_\_  
Student's name

\_\_\_\_\_  
Signature of Chair

Date \_\_\_\_\_

## CLOSE OUT PLAN FORM WHEN SWITCHING ADVISOR

\_\_\_\_\_  
Date

Current Advisor name and signature: \_\_\_\_\_

\_\_\_\_\_ Date \_\_\_\_\_

Student Name and signature: \_\_\_\_\_

Chair Name and signature: \_\_\_\_\_ Date \_\_\_\_\_

ACTIVITY PLAN	

**Date to be completed** \_\_\_\_\_ (no later than 4 weeks from the date above)

## VERIFICATION OF COMPLETION SIGNATURES

\_\_\_\_\_ Date \_\_\_\_\_  
**Current Advisor:** \_\_\_\_\_

\_\_\_\_\_ Date \_\_\_\_\_

Student: \_\_\_\_\_

Chair: \_\_\_\_\_ Date \_\_\_\_\_