COLLEGE OF AGRICULTURE AND LIFE SCIENCES
BIOCHEMISTRY
VIRGINIA TECH

GRADUATE STUDENT HANDBOOK
2025 – 2026

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I. GUIDELINES FOR GRADUATE EDUCATION

Two sets of guidelines are provided for graduate study in the Department of Biochemistry:

1. The Graduate School has general guidelines, which are found in the document *Expectations for Graduate Education*.
2. The Department of Biochemistry guidelines, which are outlined in this Handbook.

II. OVERVIEW OF GRADUATE DEGREE PROGRAMS

Department of Biochemistry Mission Statement

The mission of the Department of Biochemistry is to help build a better future by:

1. Providing aspiring molecular life scientists with the opportunity to obtain a world-class education by engaging in a program of instruction that emphasizes:
    - Critical thinking.
    - Rigorous and effective application of the scientific method.
    - Quantitative analysis.
    - Fundamental chemical, biological, and physical principles.
    - Clear and accurate written and verbal communication.
    - Intensive experiential learning activities.
2. Generating new tools and knowledge that will advance our understanding of the living world and enhance the quality of life through better medical care, disease prevention measures, nutrition, and environmentally sound and sustainable agricultural and manufacturing processes.
3. Leveraging these research activities to provide students with opportunities to participate in genuine, challenging experiential learning activities involving state-of-the-art approaches and technologies.
4. Enhancing public understanding of biochemistry, molecular biology, and science in general through public engagement via presentations, publications, and outreach to K-12 students.
5. Providing education, training, and work environments that are characterized by mutual respect, personal responsibility, fairness, equality, and a commitment to providing opportunities and support for all — especially those individuals belonging to populations traditionally underrepresented in the fields of science, technology, engineering, and mathematics [STEM].

The mission of the BS degree program in the Department of Biochemistry is to provide undergraduate students with a foundational understanding of the chemical basis of biological processes as well as the skill sets to critically evaluate, interpret and create biochemical information. This mission aligns with the institutional and college missions of educating undergraduate students in the life sciences through diverse, hands-on, experiential opportunities.

The mission of the PhD and MSLFS degree programs in the Department of Biochemistry is to provide graduate students with the ability to master discovery and translation of new knowledge concerning the molecular basis of life through interdisciplinary research and training, while enhancing quality teaching and professional skills. This mission aligns with the institutional and college missions of advancing knowledge and improving the quality of life.

Overview of Graduate Degree Programs

The Department of Biochemistry offers two graduate degrees, the Doctor of Philosophy (Ph.D.) and Master of Science in Life Sciences (MSLFS). The core requirements for both programs in terms of courses and research expectations are

similar, but each degree comes with its own requirements. At their core, each degree prepares students for careers as scientists across different specialties.

II.1. COURSEWORK

Core Courses for All Graduate Students

There are three core courses that are taken by all Biochemistry graduate students in the first year, BCHM 5224 "Protein Structure and Function" and BCHM 5984 "Gene Regulation and Medicine," taken in the Fall semester, and BCHM 5784 "Advanced Applications in Molecular Life Sciences," taken in the Spring semester. All students will enroll in ALS 5324 "Research Ethics in Agriculture and Life Sciences" ~~and ALS 5024 "Building Multicultural Competence in Agriculture and Life Sciences"~~ in the Fall semester of the first year to satisfy the Graduate School's requirement for training in ethics and research integrity (see Section II.3) ~~and the university's requirement for training in diversity education (see Section II.4).~~

Specialized Courses

Doctoral students will complete additional elective courses during the first two years and MSLFS students complete courses throughout their enrollment. Students should confer with their Major Professor and Advisory Committee to select the most appropriate courses. Doctoral students are strongly encouraged to complete all course requirements by the end of year 2. The Graduate Program Coordinator maintains a list of suggested electives. Note that availability of these courses varies from year to year and students must formulate their Plan of Study accordingly.

Statistics Requirement

All MSLFS students are required to take one 3-credit statistics course (STAT 5605 or STAT 5615 or ALS 5984). There is no statistics requirement for doctoral students, but **it is strongly recommended** that they take a statistics course as an elective.

Seminar Courses

BCHM 5004 Seminar in Biochemistry

Students will enroll in the 1-credit departmental seminar class (Pass/Fail grade mode) for each of the first four semesters that they are in the graduate program. Students are expected to continue attending the seminar even when not formally enrolled.

Research and Dissertation (Ph.D. students)

BCHM 7994 Research and Dissertation

The number of credits of BCHM 7994 varies per semester to give a total of 12 credits as required for full-time status. These credits contribute to the 90-credit graduate study requirement.

Research and Thesis (MSLFS students)

BCHM 5994 Research and Thesis

MSLFS students will enroll in BCHM 5994 for a total of 6-10 credits to meet the 30-credit graduate study requirement.

Notes on Course Requirements

- Graded course work on the Plan of Study must be taken for an A-F grade unless the course is only offered P/F. Courses offered P/F can be used to meet the graded credit minimum if **only** offered P/F.

- At least 27 graded credits (doctoral) or 12 graded credits (MSLFS) must be at the 5000 level or higher.
- The 5000-level coursework may include a maximum 18 credits total in 5974, 5984, and 6984 courses (independent study and special topics) and 4 credits of seminar.
- The Plan of Study may include a maximum of six credits of graded 4000-level undergraduate coursework. These six credits of 4000-level coursework may include Special Study (4984) but **may not** include Undergraduate Independent Study (4974) or Undergraduate Research (4994) courses.
- MSLFS students may count three of the six credits for BCHM 4124 towards Experiential Learning, but the full six credits count towards the maximum of 4000-level coursework.
- Students who are not serving as teaching assistants during the first three semesters, but during which they are supported by the department, are required to take an additional 3-credit graduate-level course. This course will count towards the five required specialized courses.

Financial Support

The 12-month stipend for **all research-active graduate students** for 2025-2026 is $34,944; this amount increases by $1,000 **for Ph.D. students** starting the semester following successful completion of the Preliminary Examination. All graduate students receive a tuition waiver. Stipend support and tuition waivers are contingent upon remaining in good academic standing and making satisfactory progress towards completion of the student's dissertation or thesis, as judged by the student's Major Professor and Advisory Committee. All students are responsible for paying any fees assessed by the university upon arrival in August in one lump sum of the first year or by enrolling in the payment plan offered by the university. Contact the Academic Program Coordinator for information about paying fees.

Health Insurance Subsidy

Virginia Tech provides a subsidy for university-sponsored health insurance plans for graduate students who are on at least a 50% assistantship contract. Thus, all research-active (e.g., supported on an assistantship) graduate students in the Department of Biochemistry are eligible for a health insurance subsidy. Students are not required to enroll in the plan, but they may do so, if desired. Enrollment is generally open from July – September each year. See https://graduateschool.vt.edu/funding/types-of-funding/assistantships/benefits.html for more information.

Academic Probation

Any student who fails to maintain satisfactory academic progress (does not achieve a B or better in any required course and/or fails to maintain an overall 3.0 GPA) will be placed on academic probation for one semester. Terms for completing academic probation and returning to good standing will be decided by the Graduate Program Director in consultation with the Department Head and provided to the student in writing. Probation may include reduction in, or loss of, stipend, scholarships, and/or tuition remission. A student who fails to satisfy the requirements for restoration from academic probation within the timeframe specified in that letter will be subject to dismissal from the graduate program.

II.2. RESEARCH ROTATIONS

Rotations are an opportunity for students to learn about the diversity of research in the department and help inform the selection of a mentor. Enrollment in BCHM 5014 and rotation talks are both **mandatory for all first-year students**.

Direct Recruiting vs. Normal Rotations

Students entering either the Ph.D. or MSLFS programs may have already arranged with a faculty member to serve as the student's Major Professor **during the admissions process**. In this case ("direct recruiting"), a student may elect to forgo formally rotating through different labs and directly join the Major Professor's lab. All other students are required to perform three laboratory rotations with different Biochemistry faculty.

General Information

- Register for BCHM 5014 in the Fall and Spring semesters as A-F. A syllabus will be provided by the Graduate Program Director each semester that details the requirements of each course. In the Fall, the grade is based on rotation evaluations, presentations, the written report, and submission of an Individual Development Plan. In the Spring, the grade is assigned via a written review article (see Section III.1).
- First-year students conduct three laboratory rotations, each approximately 4 weeks in duration.
- The Table below lists the start and end dates for each rotation. Students will submit a list of the three faculty members with whom they wish to rotate to the Rotation Coordinator **no later than 8:30 AM on the first day of classes**. If a student desires to change a rotation selection, **one change will be allowed**. To request a change in a rotation assignment, the student must email the Graduate Program Director **no later than one week** prior to the start of the start of that rotation and indicate which faculty member with whom they prefer to rotate. Any change is contingent upon faculty agreement to allow the student to rotate.
- Students who join the graduate program early (during the summer) and work in any laboratory cannot have this time counted towards satisfying the rotation requirement.
- Students will give brief presentations at the end of **two rotations** as part of the weekly seminar series. Students will be notified at least ten days in advance of their scheduled date to present and will be told how long they will have to speak.
- For the rotation for which they do not give a presentation, students will write a short journal "note" or research report. Students should discuss an appropriate format with their advisors. Example formats include *FEBS Letters*, Rapid Reports format of *Biochemistry*, and *BMC Research Notes*. The syllabus for BCHM 5014 specifies the due date and method of submission for this report.

Selection of Major Professor

After discussions with faculty of interest, students will submit a ranked list of preferences for their major professor to the Graduate Rotation Coordinator by the date indicated in the Table below. Students may choose to work with faculty other than those with whom rotations were performed. Every effort will be made to place students according to their preferences given the resources available.

Directly recruited students who forgo rotations will immediately join the Major Professor's lab by selecting that faculty member as their first choice for their "first rotation" and by notifying the Rotation Coordinator that they intend to join that lab. The Rotation Coordinator will confirm with that faculty member. All other students will select their Major Professor after the conclusion of three distinct rotations. **No exceptions will be made to allow selection of the Major Professor at any other time.**

Fall 2025 Rotations: Important Dates

Rotation	Begins	Ends	Presentation
1	08/26/2025	09/19/2025	09/22/2025
2	09/23/2025	10/17/2025	10/20/2025
3	10/21/2025	11/21/2025	12/1/2025

List of three rotation labs:	By 8:30 AM 8/25/2025
Ranked list of Major Professors:	By 8:30 AM 12/1/2025
Lab assignments made:	By 5:00 PM 12/1/2025
Thesis/dissertation research begins:	12/2/2025

The process of matching a student to a Major Professor requires the faculty member to agree to serve in this capacity and that the faculty member or Department will provide funding for the student. If a student does not match with a lab (due to faculty unwillingness to accept the student or lack of funding), the student has three options:

1. Perform a fourth laboratory rotation during the winter break
2. Change degree tracks to a non-thesis MS
3. Resign from the graduate program

In the event of a fourth rotation, if that rotation advisor does not agree to accept the student into their lab, the student will be required to change to a non-thesis MS or resign from the graduate program.

II.3. ETHICS AND RESEARCH INTEGRITY (E&RI) TRAINING

Commission on Graduate Studies and Policies Resolution 2012-13B mandates that "the Program of Study for all graduate students show a record of the student's participation in the particular ethics and integrity activities delineated by the student's program, department, or college, as part of the student's graduation requirements." This requirement came into effect for students matriculating in Fall 2014.

Required components

ALS 5324 Research Ethics in Agriculture and Life Sciences
BCHM 5784 Advanced Applications in Molecular Life Sciences
GRAD 5004 GTA Training Workshop

Additional research-specific ethics training (e.g. in treatment of animals or human subjects research) may be required by the student's Advisory Committee.

Implementation

The Department of Biochemistry will ensure the implementation of the ethics and integrity training component in the education of our graduate students in the following ways.

- The E&RI Training Plan will be provided to incoming graduate students during Orientation Week, which takes place the week prior to the start of classes. The Graduate Program Director will discuss the requirements with the students.

- At the first meeting with their Advisory Committee, graduate students will describe their progress in satisfying the E&RI training requirements and will outline a plan for completing any outstanding requirements. The Committee will also determine whether any additional training is required on the basis of the student's research plans.
- The Advisory Committee will confirm that students have completed all required elements of the E&RI Training Plan prior to defense of the thesis.
- Completion of the E&RI training requirement will be documented on the student's Plan of Study.

~~II.4. DIVERSITY AND INCLUSIVITY TRAINING~~ (Currently suspended)

~~In Fall 2019, Virginia Tech passed Commission on Graduate Studies and Policies Resolution 2017-18A "Resolution to Incorporate an Inclusion and Diversity Education Component into Graduate Education," which went into effect in Spring 2022.~~ **This requirement is currently suspended.**

~~Required Components~~

~~**GRAD 5004** – GTA Training Workshop~~
~~**BCHM 5004** – Biochemistry Seminar~~
~~**ALS 5324** – Research Ethics in Agriculture and Life Sciences~~
~~**ALS 5024** – Building Multicultural Competence in Agriculture and Life Sciences~~

II.5. THESIS AND DISSERTATION RESEARCH

Advisory Committee

In consultation with their Major Professor, students should select members of their Advisory Committee by considering whose expertise would be most relevant to the student's research. The Advisory Committee for doctoral students requires a minimum four faculty, of whom three must be affiliated with the Department of Biochemistry (either departmental or adjunct faculty). MSLFS committees shall comprise three faculty (at least two affiliated Biochemistry faculty). The Major Professor serves as the Chair of the Advisory Committee. **All students must arrange a meeting of their Advisory Committee prior to the start of the second year.** The Graduate Committee will serve in an advisory capacity for all students prior to their selection of a Major Professor.

An annual meeting with the Advisory Committee is mandatory. More frequent meetings may be scheduled as desired by the student and/or Advisory Committee. **A written summary of the student's research progress must be submitted to the Advisory Committee no later than one week prior to each meeting**. An exception to this requirement is made for the first meeting with the Advisory Committee.

Scheduling Meetings

It is the responsibility of the student to schedule all committee meetings (annual progress updates, Preliminary Examination if applicable, final defense) in a proactive manner. Meeting times should be solicited using services such as When2Meet, WhenIsGood, Doodle, etc. When a time has been identified for the meeting, the student will send a calendar invitation using a university-approved scheduling function (currently Microsoft Outlook) to all committee members, so their calendars are appropriately populated. The meeting invitation must include the location of the meeting (physical or Zoom link) and the meeting description should indicate whether the meeting is hybrid, fully online, or in person.

Graduate School Forms

A list of all forms for graduate students, including those related to academic progress and graduation (requirements and attending commencement) are available at https://graduateschool.vt.edu/forms.html.

Plan of Study

The Graduate School requires all graduate students to submit a valid Plan of Study. Each student should begin to prepare their Plan of Study for approval **at their first advisory committee meeting.** Students should use the form available from the Academic Program Coordinator and seek the assistance of their Major Professor. The Plan of Study must then be presented to, and approved by, the student's Advisory Committee, including a projected date for taking the Preliminary Examination (Ph.D. students only). This approval must be obtained at the student's first committee meeting during the first year. The student is responsible for delivering the completed, signed Plan of Study form to the Academic Program Coordinator, who submits the Plan of Study to the Graduate School electronically.

Thesis Defense/Final Exam

Degree candidates are required to present a departmental research seminar prior to the Final Exam (i.e., thesis defense). Candidates for the Ph.D. degree must take an oral Final Exam, which is primarily a defense of their dissertation. The Final Exam is scheduled by submitting the "Final Exam Request for Thesis and Dissertation" via https://ess.graduateschool.vt.edu/pages/login.php to the Graduate School two weeks in advance of the exam date. The student passes the Final Exam if all or all but one member of the Advisory Committee votes for approval. However, the degree is conferred only after "Thesis/Dissertation (ETD) Approval Request" (via https://ess.graduateschool.vt.edu/pages/login.php) has been signed by Advisory Committee members and submitted within two weeks to the Graduate School, and the Graduate School has approved the ETD (see below). See also Graduate School guidelines for final semester enrollment, degree completion and commencement. Students are encouraged to submit the "Application for Degree" on HokieSPA the semester before they plan to graduate, at which time a "to do" list will be generated to assist in timely completion of all requirements.

Electronic Thesis or Dissertation (ETD)

Virginia Tech requires a student's final thesis or dissertation to be submitted electronically in PDF format. Instructions on ETD formatting, associated policies, citations, etc. are provided on the University Libraries website: https://guides.lib.vt.edu/c.php?g=547528&p=3756956.

Annual Evaluation

As required by the Graduate School, the Major Professor will submit a written annual evaluation of the student's progress in the form of a letter addressed to the student. This letter is typically written after the student's annual Advisory Committee meeting. The examination chair's letter from the Preliminary Examination will act as the annual evaluation for the year in which a Ph.D. student completes the Exam. The evaluation letter will be distributed to the Graduate Program Director, the Graduate School, members of the Advisory Committee, and the student.

Publications

Students are expected to publish their research in peer-reviewed, professional journals. Therefore, students should have published their research or should provide the Major Professor with manuscript(s) in the appropriate format for publication prior to the time of graduation.

II.6. TEACHING

Graduate Teaching Assistant Requirement

All doctoral students serve as teaching assistants for two semesters, usually within the first three semesters of enrollment. MSLFS students serve as teaching assistants for at least one semester and may be required to serve as teaching assistants for no more than two semesters, depending on departmental needs. Students will be notified of their assignment no later than one week prior to the start of the upcoming semester. For each course, TAs will be responsible for at least **one meaningful teaching experience** beyond preparing materials and grading student work. Examples include leading a discussion, giving a guest lecture, or leading a help session for working on problem sets and/or preparing for exams.

The goals for the TA assignment are primarily for students to:

- Develop teaching and communication skills, and
- Support the implementation of undergraduate courses, especially courses that enroll many students (large lecture courses) or that require significant time or effort to prepare materials (lab courses).

Graduate Teaching Assistant Policy

All GTAs will be provided with a written list of expectations from the faculty instructor with whom they will be working. The faculty member and GTA will have a meeting, ideally before the semester starts or within the first week of the semester, to discuss expectations and duties. A form will be provided that will include all duties and expected time commitments. This form will also include a description of the activity(ies) that constitute the meaningful teaching experience and should be formed as a mutual agreement of the faculty instructor (based on course needs) and the professional goals and development of the GTA. The faculty instructor and GTA will each sign the form, acknowledging that they agree to its contents, and return it to the Graduate Program Coordinator for departmental records.

Graduate Teaching Scholar Program

The College of Agriculture and Life Sciences sponsors the Graduate Teaching Scholar (GTS) program (https://www.cals.vt.edu/academic-programs/current/graduate/gts.html) for aspiring educators. As part of this program, graduate students are mentored by faculty members in instruction and gradually take over full responsibility for teaching a class of the student's choice. That is, over a three-year period, the student progresses from a teaching assistant, to co-instructor, to full instructor of record.

Virginia Tech Graduate Academy for Outstanding Graduate Pedagogy (AOGP)

AOGP is organized within the Graduate School to support and celebrate outstanding pedagogy by graduate students. For more information, visit https://aogp.graduateschool.vt.edu/AOGP.html.

Virginia Tech Center for Excellence in Teaching and Learning (VT-CETL)

VT-CETL is a professional resource for improving pedagogical methods, assessing course effectiveness, and providing training for essential educational tools like campus. Visit https://teaching.vt.edu for more information.

III. THE DOCTOR OF PHILOSOPHY (Ph.D.) DEGREE PROGRAM

The doctoral program in the Department of Biochemistry at Virginia Tech prepares students for careers as independent researchers in biochemistry, molecular and cellular biology, molecular microbiology, biotechnology, and related areas. Training involves a combination of advanced coursework, participation in seminars, and laboratory research conducted under the guidance of a faculty committee selected by agreement of the student, the faculty advisor, and the departmental Graduate Committee.

Graduate School

- ❑ Complete 90 credits of graduate study
- ❑ The 90 total credits must include 30 graded credits (i.e., from coursework)
- ❑ Pass the Preliminary Examination and dissertation defense
- ❑ Complete the ethics and research integrity training
- ❑ ~~Complete the diversity education requirement~~ (currently suspended)

Department of Biochemistry

- ❑ Successfully complete **three core courses** (B grade or better) and **additional specialized courses** during their first two years
- ❑ Maintain **a cumulative GPA of 3.0** or above in all coursework
- ❑ Enroll in three laboratory rotations during the first semester
- ❑ Deliver one departmental seminar while registered in the doctoral program, excluding the dissertation defense seminar
- ❑ Serve as Teaching Assistants for Biochemistry courses for two semesters (generally during the first two years, but departmental needs will vary)
- ❑ Pass the Qualifying Examination at the end of the Spring semester of the first year

Typical Schedule for a Biochemistry Doctoral Student

	Fall	Credits	Spring	Credits
Year 1	**BCHM 5004** Biochemistry Seminar	1	**BCHM 5004** Biochemistry Seminar	1
	BCHM 5014 Rotations	4	**BCHM 5014** Rotations	4
	BCHM 5224 Protein Structure & Function	3	**BCHM 5784** Adv Applic in Mol Life Sci	3
	BCHM 5984 Gene Regulation & Med	3	~~**ALS 5024** Building Multicult Comp in ALS~~	~~1~~
	ALS 5324 Research Ethics in Ag & Life Sci	1	**XXXX XXXX** Elective	3
			BCHM 7994 Research & Dissertation	1
	Total	**12**	**Total**	**12**
Year 2	**BCHM 5004** Biochemistry Seminar	1	**BCHM 5004** Biochemistry Seminar	1
	XXXX XXXX Elective	3	**XXXX XXXX** Elective	3
	BCHM 7994 Research & Dissertation	8	**BCHM 7994** Research & Dissertation	8
	Total	**12**	**Total**	**12**
Years 3-5	**BCHM 7994** Research & Dissertation	12	**BCHM 7994** Research & Dissertation	12
	Total	**12**	**Total**	**12**

III.1. QUALIFYING EXAMINATION

The Qualifying Examination is completed by earning a B or better in BCHM 5014 in the Spring semester. The principal assignment for BCHM 5014 (Spring) is for students to write a review article **on a topic of the student's choosing**. This topic may or may not be related to their dissertation work. Based on the chosen topic, the student will select a journal within the *Current Opinion* series (https://www.elsevier.com/life-sciences/journals/core/current-opinion) and prepare a manuscript according to the author guidelines for the chosen journal. Formatting and content must adhere to the journal's requirements, including number, recency, and format of citations; word count; section headings, figures and organization; and any other attribute described in the relevant journal's "Guide for Authors." Specific requirements for the Qualifying Examination also include:

1. At least **400 words** must be dedicated to providing future perspective on the topic at hand, wherein the student identifies a key problem or knowledge gap in the field and proposes a line of inquiry to address this gap. Given the nature of a review article, students do not need to propose detailed experiments but should describe future directions of their chosen field and general approaches that could be used.
2. Students must include at least **two original figures** with descriptive captions as part of the written document.
3. At least **40% of references cited** must have been published within the last five years.

Qualifying Examination Timeline and Examination Committee

The process for evaluating the review article will follow a typical process for manuscript submission. The Exam will take place during the Spring semester of a Ph.D. student's first year in the program. Key dates for this timeline are given below. The Graduate Program Director will establish a pool of three reviewers from among the Biochemistry faculty on the Graduate Program Committee who will be charged with reviewing the submissions and providing written feedback. Each Qualifying Examination will be reviewed by three faculty – two from the reviewer pool chosen by the Graduate Program Director (one of whom will serve as the student's Examination Committee Chair) and the third member will be the student's Major Professor. The composition of each student's Examination Committee will be communicated by the Graduate Program Director. The committee will also assign a letter grade at the conclusion of the process, which will be the student's assigned grade in BCHM 5014 for the spring semester. As with any required class, a student must earn a B or better to be considered in good standing and having passed the Qualifying Examination. Near the end of the semester, each student will give a brief presentation of their research topic at a special departmental seminar. This presentation is part of the graded assessment of the Qualifying Examination and students should expect to be questioned about papers they cited as well as their identified knowledge gap and direction of their chosen field.

Students are allowed to ask for assistance from the Examination Committee Chair, but the Chair will not provide scoring assessments. The Chair may offer suggestions to help clarify the student's writing or development of their review, at the sole discretion of the Chair. Students may seek "peer review" feedback at any time from other graduate students and may practice their oral presentations with other students. No other faculty are to be consulted regarding the Qualifying Examination, including the student's Major Professor, without explicit permission of the Examination Committee Chair.

Students will submit all materials via the BCHM 5014 Canvas site by 5:00 PM on the dates specified by the course leader. Students are prohibited from using generative artificial intelligence (AI) services (e.g., ChatGPT). The text of all submitted documents will be assessed using AI-detecting software and, if AI-generated text is found, will result in failure of the Qualifying Examination.

Evaluation of the Qualifying Examination

Students' written proposals will be evaluated in three categories that assess the quality of their writing, synopsis of the literature, adherence to journal requirements, and identification and description of new areas of inquiry. The rubric for evaluating the written portion of the Qualifying Examination is given below:

(i) Preparing the manuscript according to journal requirements

1. The student adheres to all requirements related to word count, number of references (including required highlight descriptions and fraction within the last two years), includes at least two original figures with appropriate, descriptive captions, and includes at least 400 words on knowledge gaps and future directions.
2. The student adheres to most of the requirements but may lack some references or aspects of journal style, fails to include both figures, or writes fewer than 400 words on knowledge gaps and future directions.
3. The student does not follow instructions or fails to meet multiple requirements related to length and content.

(ii) Reviewing and summarizing relevant scientific literature

1. The student includes all relevant literature and provides a meaningful, comprehensive summary. The student demonstrates understanding of all underlying conceptual bases of work cited. Oral presentation follows logically, and key concepts are clearly articulated.
2. The student includes most of the relevant literature, provides a meaningful summary, and demonstrates understanding of most key concepts. Oral presentation articulates most of the key concepts necessary to understand the state of the field.
3. The student omits relevant literature, or does not adequately summarize, or does not demonstrate adequate conceptual understanding.

(iii) Responding to reviewer comments

1. The student responds adequately to all points made by the reviewers and includes appropriate descriptions of changes made or reasons why changes were not made in response to reviewer comments.
2. The student responds adequately to most of the points made by the reviewers but misses some important opportunities for improvement.
3. The student fails to respond adequately or does not provide any explanation of changes made following committee review.

A fourth category of grading pertains solely to the oral presentation delivered at the end of the semester. The rubric of the presentation is given below:

(iv) Delivering an effective oral presentation

1. The student prepares clear slides and effectively uses graphics to illustrate key points. Slides are devoid of typographical errors. The student provides detailed answers to questions after the oral presentation.
2. The student prepares an adequate presentation that may be augmented by better use of illustrations or more concise slides. The student provides reasonable answers to most questions after the oral presentation.
3. The student prepares slides that are confusing, ineffective, or distracting due to errors/typos. The student makes critical mistakes or is unable to provide adequate answers to questions after the oral presentation.

Scores in each category will be combined in an average and translated to letter grades for BCHM 5014 using the following table.

Average Score	Letter Grade
1.00 – 1.50*	A
1.51 – 1.70*	A-
1.71 – 1.87*	B+
1.88 – 2.13*	B
2.14 – 2.33	B-
2.34 – 2.53	C+
2.54 – 2.80	C
2.81 – 3.00	C-

* These averages must not result from a score of 3 in any category. If any category is rated a 3 (unacceptable), the letter grade assigned will be no higher than a B-, and will be determined by uniformly assigning a letter grade 4 categories lower than the average score would otherwise dictate. For example, a student with an A and an average of 1.2 (individual scores of 1, 1, 1, 3) will be assigned a B-. A student with an average score of 2 (1, 2, 2, 3) will not receive a B, they will receive a C-.

Outcome of the Qualifying Examination

As a required course, students must earn a B or better (see Table above) in BCHM 5014 to pass the Qualifying Examination. Failure to earn a B or better will result in the student being placed on academic probation (see Section II.1). The consequences of this probation include, but are not limited to, continuation on the Ph.D. track with additional coursework or performance requirements, conversion to the M.S. track, or dismissal from the graduate program.

III.2. PRELIMINARY EXAMINATION

To advance to Ph.D. candidacy, students must pass a Preliminary Examination consisting of an oral defense of an original, written research proposal. The purpose of this Exam is to determine whether a student has sufficient depth and breadth of understanding to propose, execute, and defend their dissertation research project.

Scheduling

The Preliminary Exam must be scheduled with the Graduate School **no later than two weeks prior to the exam** via https://ess.graduateschool.vt.edu/pages/login.php. The Exam must take place by the end of the second academic year (i.e., by the last day of exams in the Spring semester). Do not schedule a Preliminary Examination during the summer or winter breaks.

Examination Committee

In the Department of Biochemistry, the Major Professor is not part of the Preliminary Exam Committee. Because the Graduate School requires that the doctoral Preliminary Exam Committee have four members, the Chair of the Preliminary Exam Committee is selected from Biochemistry faculty outside of the Advisory Committee. Before the Preliminary Exam, the student must make a request to a Biochemistry faculty member to serve as the Chair of the Exam Committee. The request must then be sent to the Graduate Program Director via email for approval.

Written Research Proposal

- Students prepare a **10-page original research proposal** based on their dissertation project.
- The proposal must be formatted according to National Institutes of Health or National Science Foundation guidelines (except for length) and must include descriptions of the significance, background, impact, and research plan of the project. Research plans should include the underlying rationale, significance, experimental design, anticipated results, alternative hypotheses or explanations, and potential problems as well as how

problems will be addressed (i.e., backup plans). While proposals may include preliminary results, this section should be kept to a minimum (around one page) with the bulk of the proposal focused on describing plans for completing the dissertation research. The Department strongly encourages submission of modified versions of these proposals as NIH F31 or NSF GRFP fellowship applications. The College of Agriculture and Life Sciences offers a $500 award to any student who applies for a fellowship, to be used to support travel to a conference in the student's discipline.

- The writing of the proposal must be original. Students should avail themselves of all available resources but **cannot copy verbiage from any grant proposals or manuscripts written by others**. If there is a connection between the student's research proposal and work that the advisor has proposed, the student's research aims and proposed activities should **build upon, and move beyond, those of the advisor**. The role of the Major Professor is to discuss with the student their research goals and objectives, principles of experimental design and techniques, and elements of good scientific writing. The advisor should not author verbiage for the student.
- **Three weeks prior** to oral examination, proposals must be submitted to the Exam Committee for determination of whether the proposal is satisfactory for oral defense. The Exam Committee Chair will consult with the Major Professor and decide whether the student can proceed with the oral exam. Minor issues can be corrected, and the proposal redistributed prior to oral exam. Substantial issues that require considerable rewriting may require rescheduling of the oral exam.
- The final document must be distributed to the Exam Committee **one week prior to the oral exam**.
- Except in extraordinary circumstances, a student who misses a distribution deadline will need to reschedule the oral exam.
- Except in extraordinary circumstances, a student who fails to make timely progress in completing both aspects of the Preliminary Exam will have this issue noted in an annual or semi-annual evaluation and will be at risk of dismissal from the program.

Oral Examination

- Students should prepare a brief (~20 minute) overview of their proposal. The length of the presentation and the format of the exam, including whether questions will be allowed during this time, are the purview of the Exam Committee Chair. Students should consult with the Chair well in advance of the Exam to understand the format and expectations.
- Committee members will question the student with the research proposal as a starting point. Questions will focus on assessing the student's ability to design experiments, interpret experimental results, and recognize alternate approaches should the main strategy fail.
- Discussion will not be limited to the research proposal. Members of the Exam Committee may pursue whatever other areas they feel are necessary to evaluate the abilities and knowledge of the student, including topics addressed in the coursework the student has completed.
- Based on a student's performance during the exam, the committee will recommend: (a) advancement to candidacy, (b) conditional advancement contingent upon completion of recommended coursework or individual study, or (c) failure. In the event of failure, a second Preliminary Exam must be scheduled during the semester immediately following the first attempt.
- Students are allowed a **maximum of two opportunities** to pass the Preliminary Exam.
- The Exam Committee Chair will provide a letter to the student describing the outcome of the exam, summarizing the strengths and weaknesses of the student's performance, and articulating the committee's recommendations regarding the student's future work. The letter is sent to the student with copies sent to the Major Professor and the Department of Biochemistry for inclusion in the student's file.

Preliminary Examination Checklist

- ❑ Request a faculty member to serve as the exam committee chair (early in the semester during which you take the exam), email Graduate Program Director for approval of this choice
- ❑ Schedule your examination with your committee (early in the semester during which you take the exam)
- ❑ Send calendar invitation to committee members confirming time and location of the examination
- ❑ Submit your written document to your committee three weeks ahead of the exam date
- ❑ File a request for the exam with the Graduate School two weeks prior to the exam
- ❑ If requested by your committee, submit any corrections to the written proposal one week before the exam

Evaluation of the Preliminary Examination

Students' proposals and oral defenses are evaluated in four (equally weighted) categories, in which they are assigned a numerical score by the Examination Committee, from 1 to 3 (1 is highest, 3 is lowest). The categories and interpretation of the scores in each category are listed here.

(i) Reviewing and summarizing relevant scientific literature

1. The student includes all relevant literature and provides a meaningful, concise summary. Student understands all underlying conceptual bases of work cited.
2. The student includes most of the relevant literature, provides a meaningful summary, and illustrates understanding of most key concepts.
3. The student omits relevant literature, or does not adequately summarize, or does not illustrate adequate conceptual understanding.

(ii) Writing a research proposal, including (1) explanation of specific aims, (2) methods to be used, (3) expected results, and (4) alternate plans

1. The four key areas described above are included, adequate consideration is given to each, descriptive passages are well-written, and logical assessment of controls and alternate plans is described.
2. The four key areas described above are included, adequate consideration is given to most, and logical assessment of most controls and alternate plans is described.
3. The student does not include these four sections, or does not consider a key, fundamental point that renders the proposed work impossible, incomplete, or without novelty.

(iii) Oral scientific communication skills

1. The student can frame proposed work in the appropriate context, has prepared excellent graphics, can communicate a clear and concise summary of proposed work, and can answer most questions posed by committee.
2. One of the above areas is lacking.
3. Two or more of the above areas are lacking.

(iv) Understanding the scientific process, experimental design, and concepts of relevant biochemistry and molecular biology techniques.

1. The student can articulate clear, testable hypotheses and suitable experimental approaches to test them, in addition to demonstrating an understanding of how relevant experiments are performed and interpreted.
2. One of the above areas is lacking.
3. Two or more of the above areas are lacking.

III.3. RESEARCH PRESENTATIONS

After passing the Preliminary Exam and before the Thesis Defense, **students are required to give one oral presentation on their research**. This requirement is fulfilled by giving a presentation in BCHM 5004 "Seminar in Biochemistry."

III.4. DOCTORAL STUDENT TIMELINE

This table depicts the typical timeline for doctoral students who enter with a B.S. degree to complete the activities described above for completion of a doctoral degree.

	Committee Established	Plan of Study Filed	Prelim Exam Taken	Dissertation Defended	ETD Submitted	Graduated
Timeline	Prior to fall semester of 2nd year	Prior to fall semester of 2nd year	End of spring semester of 2nd year	Within five years	Within five years	Within five years

Doctoral students typically convene their Advisory Committees after the Qualifying Examination (typically late April but can be during the summer – the first meeting must occur prior to the start of the Fall semester of the second year). Students should be actively discussing with faculty their willingness to serve on Advisory Committees during the Spring semester, before the Qualifying Examination.

IV. THE MASTER OF SCIENCE IN LIFE SCIENCES (MSLFS) DEGREE PROGRAM

The Master of Science in Life Sciences (MSLFS) merges the efforts of the departments of Biochemistry, Entomology, Food Science and Technology, and Plant Pathology, Plant Physiology, and Weed Science. Students in basic and applied disciplines in the College of Agriculture and Life Sciences share common experiences that prepare them for careers in which interdisciplinary interactions become increasingly valued. At the same time, discipline-specific education and research experience, which characterizes the MSLFS program in each department, prepares students for unique positions and career development. For graduation, students must complete a minimum of 20 graded credit hours among 30 total credit hours. Completion of a thesis-based MSLFS degree through the Department of Biochemistry requires collection, documentation, and graphical representation of publication-quality data. A non-thesis option (satisfying degree requirements via coursework only) is discussed in Section IV.4.

Graduate School

- ❑ Complete 30 credits of graduate study
- ❑ The 30 total credits must include 20 graded credits
- ❑ Complete the ethics and research integrity training
- ❑ ~~Complete the diversity education requirement~~ (currently suspended)

Department of Biochemistry

- ❑ Successfully complete **three core courses** (B grade or better) and **additional specialized courses**
- ❑ Maintain **a cumulative GPA of 3.0** or above in all coursework
- ❑ Successfully complete 6-10 credits of Research and Thesis
- ❑ Present one departmental seminar (excluding the thesis defense seminar), and defend a thesis
- ❑ Serve as Teaching Assistants for Biochemistry courses for one semester

Typical Schedule for a Biochemistry MSLFS Student

	Fall	Credits	Spring	Credits
Year 1	**BCHM 5004** Biochemistry Seminar	1	**BCHM 5004** Biochemistry Seminar	1
	BCHM 5014 Rotations	4	**BCHM 5014** Rotations	4
	BCHM 5224 Protein Structure & Function	3	**BCHM 5784** Adv Applic in Mol Life Sci	3
	BCHM 5984 Gene Regulation & Med	3	~~**ALS 5024** Building Multicult Comp in ALS~~	~~1~~
	ALS 5324 Research Ethics in Ag & Life Sci	1	**XXXX XXXX** Elective	3
			BCHM 5994 Research & Thesis	1
	Total	**12**	**Total**	**12**
Year 2	**BCHM 5004** Biochemistry Seminar	1	**BCHM 5004** Biochemistry Seminar	1
	STAT 5605 Biometry	3	**BCHM 5994** Research & Thesis	11
	BCHM 5994 Research & Thesis	8		
	Total	**12**	**Total**	**12**

IV.1. POSSIBLE ADMISSION TO THE DOCTORAL PROGRAM

All MSLFS students complete the review article assignment in BCHM 5014 in the spring semester (see Section III.1) and, as such, will have satisfied the requirement of the Qualifying Examination (Section III.1) if they earn a B or better. MSLFS students interested in continuing on to pursue a Ph.D. upon completion of their MSLFS degree should discuss this interest with their Major Professor. Having completed the Qualifying Examination, MSLFS students can enter the doctoral program upon completion of their MSLFS degree if they choose to apply, and are admitted, to the Ph.D. program. These applicants are eligible for application fee waivers and should contact the Graduate Program Director prior to applying.

IV.2. ACCELERATED BS/MS PROGRAM

Students may enter the MSLFS program during their senior year of undergraduate study and pursue B.S. and MSLFS degrees simultaneously. Students in the accelerated BS/MS program will complete undergraduate coursework alongside required graduate courses. Modifications to the timing of required courses (see Table above) may be made with the written permission of the Graduate Program Director. Students in the accelerated BS/MS program are expected to complete all degree requirements of the MSLFS program but do so on a compressed timeline.

Application and Funding

Undergraduate students who are already engaged in undergraduate research in a Biochemistry faculty member's laboratory wishing to enter the accelerated BS/MS program must apply for graduate admission no later than **December 15 of their junior year**. A pre-inquiry of suitability directed to the Graduate Program Director is required. Students in the BS/MS program are considered undergraduate students during their first year in the program and thus receive no stipend, tuition remission, or health benefits. Upon completion of their B.S. degree, students become MSLFS students for their second year and receive a stipend and tuition support for one year only. The student's MSLFS graduate contract will begin on August 10 of the MSLFS year. Any possible funding for the summer between completion of the B.S. and starting in the MSLFS program is the responsibility of the student's Major Professor and is not guaranteed. The student is responsible for discussing possible funding with their Major Professor.

Research Lab Assignment

BS/MS students are accepted on the understanding that they will perform their MSLFS thesis work in the laboratory in which they are performing research at the time of their application. Thus, the student will complete three "rotations" in this laboratory to satisfy the requirements of BCHM 5014. If a student elects to leave the laboratory in which they previously performed research, they must complete three rotations in separate laboratories, at which time their admission to the traditional MSLFS program will be subject to approval by the Graduate Committee after completion of their B.S. as the compressed timeline on which they will complete their thesis will no longer be feasible.

Coursework

BS/MS students must complete the Accelerated Undergraduate/Graduate Degree and Course Designation Form to indicate which classes will be counted jointly for their B.S. and MSLFS degrees. On this form, the student needs to list 6 credits of 4000-level undergraduate courses and 6 credits of 5000-level graduate courses that are taken A-F (not P/F). Typically, the 6 credits of graduate coursework are BCHM 5224 and 5784. This form must be completed at the beginning of the Fall semester during the first year of enrollment (i.e., the student's senior year as an undergraduate student) and submitted to the Graduate Program Coordinator. The listed courses count toward credits earned and GPA for both the B.S. and MSLFS degrees.

Typical Schedule for an Accelerated Biochemistry BS/MS Student

	Fall	Credits	Spring	Credits
Year 1 (BS)	**BCHM 4XXX** Undergraduate course	3	**BCHM 4XXX** Undergraduate course	3
	BCHM 5224 Protein Structure & Function	3	**BCHM 4XXX** Undergraduate course	3
	BCHM 5004 Biochemistry Seminar	1	**BCHM 5004** Biochemistry Seminar	1
	BCHM 5984 Gene Regulation & Med	3	**BCHM 5784** Adv Applic in Mol Life Sci	3
	BCHM 5014 Rotations	4	**BCHM 5014** Rotations	4
	Total	**14**	**Total**	**14**
Year 2 (MS)	**BCHM 5004** Biochemistry Seminar	1	**BCHM 5004** Biochemistry Seminar	1
	STAT 5605 Biometry	3	**BCHM 5994** Research & Thesis	11
	BCHM 5994 Research & Thesis	7	~~**ALS 5024** Building Multicult Comp in ALS~~	~~1~~
	ALS 5324 Research Ethics in Ag & Life Sci	1		
	Total	**12**	**Total**	**12**

IV.3. MSLFS STUDENT TIMELINE

This table depicts the prescribed timeline for MSLFS students who enter with a B.S. degree to complete the activities noted above.

	Committee Established	Plan of Study Filed	Thesis Defended	ETD Submitted	Graduated
Timeline	End of fall semester of 1st year	End of fall semester of 1st year	Within two years	Within two years	Within two years

Note that while Ph.D. students typically form their Advisory Committees and convene meetings after the Qualifying Examination (typically late April), MSLFS students should form their Advisory Committees **as soon as possible upon choosing a Major Professor**. Since MSLFS students are expected to complete their degrees within two years, the earlier the student receives feedback on the direction of their research project, the better it is for the student. While the Plan of Study **must** be submitted by the end of Spring semester of the first year, it is **strongly recommended** that students complete their Plan of Study to be approved by the Advisory Committee during the first meeting during Fall semester.

IV.4. THESIS REQUIREMENT

MSLFS students who enter the graduate program on the thesis track do so with the expectation that they will complete a thesis, however if circumstances dictate that completing a thesis is not feasible, the student may be allowed to graduate without submission of a formal thesis. This option is only available with the agreement of the Major Professor and Advisory Committee. The student must have met the minimum requirement of 6 credit hours of research or independent study. In this case, the student is required to submit all data (raw data, figures, presentation slides, etc.) to the Major Professor in a format suitable for publication prior to graduation.

MSLFS students who enter the graduate program on the non-thesis track (i.e., "professional Master's degree") have no expectation of completing a thesis. These students earn their degrees solely by completing graduate-level coursework. Professional MSLFS students **receive no financial support**; they must pay the cost of tuition and fees and are not eligible for an assistantship.

V. COMPARISON OF DOCTORAL AND MSLFS PROGRAM REQUIREMENTS

Requirement	Doctoral	MSLFS (thesis)	MSLFS (non-thesis)
Total Credits	90	30	30
Graded Credits	30	20	20
Required Courses	BCHM 5014 (8 cr) BCHM 5224 (3 cr) BCHM 5784 (3 cr) BCHM 5984 (3 cr) ALS 5324 (1 cr) ~~ALS 5024 (1 cr)~~	BCHM 5014 (8 cr) BCHM 5224 (3 cr) BCHM 5784 (3 cr) BCHM 5984 (3 cr) ALS 5324 (1 cr) ~~ALS 5024 (1 cr)~~ STAT 5605 or STAT 5615 or ALS 5984 (3 cr)	BCHM 5224 (3 cr) BCHM 5784 (3 cr) BCHM 5984 (3 cr) ALS 5324 (1 cr) ~~ALS 5024 (1 cr)~~ STAT 5605 or STAT 5615 or ALS 5984 (3 cr)
Elective Credits	12+	9+	17+
Laboratory Rotations	Yes* BCHM 5014 (8 cr)	Yes* BCHM 5014 (8 cr)	No
Required Research Credits (BCHM 5994 or BCHM 7994)	Varies**	6 required (max 10), may enroll in more	0
Seminar Requirement	BCHM 5004 first four semesters, must give 1 presentation	BCHM 5004 for four semesters, must give 1 presentation	None
Advisory Committee	Spring of Year 1 4 members	Fall of Year 1 3 members	Fall of Year 1 1 member
Qualifying Examination	Yes	No	No
Preliminary Examination	Yes	No	No
Defend Dissertation or Thesis	Yes	Yes***	No

* Students directly recruited into the lab of their Major Professor still enroll in BCHM 5014 and must satisfy the requirements of the rotation program but will complete all three rotations in the lab of the Major Professor.
** BCHM 7994 comprises the balance of credits necessary to maintain full-time status each semester. See typical schedule (Section III) for guidance.
*** See Section IV.5 for exceptions to this requirement.

VI. CAREER DEVELOPMENT

Most graduate and post-doctoral trainees do not end up in academic tenure-track positions. It is important that graduate students think about and plan for their post-graduation careers. Fortunately, there is a growing number of resources and opportunities for help with this.

The Biochemistry Graduate Student Association (BcGSA)

The BcGSA is a student-run organization that includes all current graduate students working in laboratories of Biochemistry faculty members. The BcGSA plans several professional development activities each year.

Broadening Experiences in Scientific Training (BEST) Project

Virginia Tech has recently been awarded a BEST grant from the National Institutes of Health to support professional development activities for doctoral students and postdoctoral trainees in the biomedical sciences. Students may enroll in one or more of the BEST program activities that are designed to **B**roaden the **E**xperiences of **S**cientific **T**rainees to:

- provide exposure to multiple diverse career paths in the biomedical sciences
- provide early career guidance and skill development
- better prepare trainees to pursue a variety of career paths

Transformative Graduate Education (Graduate School)

Transformative Graduate Education is a university-wide initiative developed by former Vice President and Dean for Graduate Education Karen DePauw and facilitated by the Graduate School. The implementation of unique programs and opportunities pushes the boundaries of traditional disciplinary academic education and provides the philosophical underpinnings for a truly innovative graduate education experience. The initiative aims to significantly change how graduate students are prepared to become the next generation of scientists, educators, scholars, engineers, artists, and career professionals in an ever-evolving global context.

Interdisciplinary Graduate Education (IGEPs, Graduate School)

The Graduate School sponsors several interdisciplinary programs for graduate education that focus on using innovative and integrated approaches to prepare students to solve emerging challenges. For more information, visit the IGEP website.

Professional Development Courses

There are several professional development courses that may be of interest. Students should confer with their Major Professor and Advisory Committee to decide whether one of these might be beneficial. The indicated GRAD 5XXX courses are recommended for more advanced students and are generally not taken in the first year.

BIOL	**5154**	Exercises in Grantsmanship
GRAD	**5104**	Preparing the Future Professoriate
GRAD	**5114**	Contemporary Pedagogy

Graduate School Courses

Toward the goal of transforming graduate education at Virginia Tech, the Graduate School has created a series of graduate courses and experiences designed to better prepare and equip our graduate students with knowledge and skills for meaningful and relevant contributions as citizens in the 21st century.

Individual Development Plan (IDP)

The National Institutes of Health recommends that all NIH-funded trainees prepare an Individual Development Plan to explore and set career goals. There is a free IDP web interface run by the journal *Science*. **All students must complete an IDP to be submitted to their Major Professor (and ideally their entire Advisory Committee) prior to the first committee meeting.**

Career Services, Division of Student Affairs

Career Services can assist with all aspects of career planning. See services directed to graduate students.

VII. FACILITIES

Keys

Keys are available for the main door and for specific laboratories. Keys for Engel Hall are distributed by Emily Simpson (Engel main office, room 111) upon payment of a deposit. Keys for Fralin are distributed by Paul Bibb (Fralin main office). Students needing access to other buildings should consult their Major Professor.

Graduate Student Lounge

The graduate student lounge (Engel 217B) is available for use by graduate students and is accessible with a code that is provided by the BcGSA president. The room contains a refrigerator and microwave, a seating area, and a white board.

Equipment

Students may use any departmental instruments after checking with the appropriate faculty to ensure that the student is knowledgeable in the proper operating techniques and will not interfere with other work in progress. Students should be sure that borrowed items are always signed out, log books are properly maintained, and the instrument and/or lab area are cleaned after use. Students should notify the faculty in charge immediately if equipment malfunctions or breaks during use. Ultimately, Major Professors are responsible for the care of equipment used by their students.

VIII. RESOURCES

Topic	Organization
Writing Resources	Virginia Tech Writing Center
Teaching Resources	Center for Excellence in Teaching and Learning Graduate Education Development Institute
Graduate School	Support Resources The Office of the Graduate Ombuds Transformative Graduate Education Formatting Guidelines for Theses and Dissertations "Graduation 101 Series"- a set of YouTube videos: • Graduation Guidelines • Preparing for Graduation • Start of Semester Defense Exception • ETD Review
Other Professional Resources	Career Services
Quality of Life Resources	Cook Counseling Center Women's Center at Virginia Tech Graduate Life Center Schiffert Health Center

IX. INSTITUTIONAL POLICIES

Equal Opportunity Statement

Virginia Tech does not discriminate against employees, students, or applicants on the basis of age, color, disability, gender, national origin, political affiliation, race, religion, sexual orientation, genetic information, veteran status, or any other basis protected by law. Discrimination or harassment on any of these bases is prohibited by Policy 1025, "Anti-Discrimination and Harassment Prevention Policy" and Policy 1026, "Policy on Title IX Sexual Harassment and Responsible Employee Reporting."

SAFE at VT and Title IX at Virginia Tech

The university offers resources for understanding Title IX, providing training materials, and describing procedures for reporting discrimination at https://oea.vt.edu/title-ix-vawa.html.

Disability Accommodations

Accommodations are available for students with disabilities. Please notify the Major Professor and/or course Instructor of any accommodations needed. Accommodations are approved through the Services for Students with Disabilities Office.

Graduate Honor System

Compliance with the standards of academic conduct expressed in the Graduate Honor Code is expected of all students.

Academic Bullying

The Department of Biochemistry denounces any form of professional misconduct and/or academic bullying. The university provides several resources for disrupting academic bullying and supporting students. This information can be found online via the Graduate Ombuds office website.

Principles of Community

Virginia Tech is a public land-grant university, committed to teaching and learning, research, and outreach to the Commonwealth of Virginia, the nation, and the global community. Learning from the experiences that shape Virginia Tech as an institution, we acknowledge those aspects of our legacy that reflected bias and exclusion. Therefore, we adopt and practice the following principles as fundamental to our on-going efforts to increase access and inclusion and to create a community that nurtures learning and growth for all of its members:

- ***We affirm*** the inherent dignity and value of every person and strive to maintain a climate for work and learning based on mutual respect and understanding.
- ***We affirm*** the right of each person to express thoughts and opinions freely. We encourage open expression within a climate of civility, sensitivity, and mutual respect.
- ***We affirm*** the value of human diversity because it enriches our lives and the University. We acknowledge and respect our differences while affirming our common humanity.
- ***We reject*** all forms of prejudice and discrimination, including those based on age, color, disability, gender, national origin, political affiliation, race, religion, sexual orientation, and veteran status. We take individual and collective responsibility for helping to eliminate bias and discrimination and for increasing our own understanding of these issues through education, training, and interaction with others.
- ***We pledge*** our collective commitment to these principles in the spirit of the Virginia Tech motto of *Ut Prosim* (That I May Serve).

X. FACULTY RESEARCH AREAS

Faculty Name	Research Program
Kylie Allen	Metalloenzymes in methanogenic archaea
Anne Brown	Protein structure-function relationships; molecular modelling; computer-aided drug discovery; biochemistry education
Dennis Dean	Enzymology and molecular genetics of metallocluster biosynthesis; biological nitrogen fixation
Soumi Ghosh	Understanding infection pathways via interactions with viral glycoproteins
Alejandro Gomez-Toledo	Structure, function, and evolution of virulent streptococcal glycosidases
Richard Helm	Cell-cell communication in model systems; application of mass spectrometry to life sciences research
Danish Khan	Mechanism of ribosomal stalling
Michael Klemba	Hemoglobin catabolism by the human malaria parasite, *Plasmodium falciparum*; protein trafficking to the food vacuole
Chloé Lahondère	Impact of temperature on disease vector insect-host-pathogen interactions
Justin Lemkul	Protein and nucleic acid simulations; conformational ensembles of disordered states; empirical force field development; computer-aided drug design
Biswarup Mukhopadhyay	Methanogenic archaea

Stefan Roberts	Molecular mechanisms by which transcriptional regulators control gene expression
Wei Sun	RNA biology
Zhijian Tu	Mosquito sex determination
Clément Vinauger	Neural and molecular mechanisms that modulate the way disease vector insects interact with their vertebrate host
Jinsong Zhu	Signal transduction and gene regulation in insects; genetic control of the mosquito defense reactions against malaria parasites

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ACKNOWLEDGMENT PAGE

I, _____ (print name), have received a copy of the 2025 – 2026 Biochemistry Graduate Student Handbook and have read and understand its contents, the requirements of my degree program, and the expectations the Department and Virginia Tech have for me as a graduate student. If I have any questions about the content of the Handbook or any policy or procedure therein, I understand that it is my responsibility to seek clarification directly from the Graduate Program Director.

_____
Signature

_____
Date