GRADUATE STUDENT RESOURCE GUIDE

Department of Biological Systems Engineering

COLLEGE OF ENGINEERING
COLLEGE OF AGRICULTURE AND LIFE SCIENCES
BIOLOGICAL SYSTEMS ENGINEERING
VIRGINIA TECH™

Created by the BSE Graduate Student Organization

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INTRODUCTION

Welcome to the Biological Systems Engineering (BSE) Department at Virginia Tech! This guide was created by BSE graduate students to assist with navigating graduate school as a new student and to answer questions commonly asked by all BSE graduate students. The BSE Graduate Student Organization surveyed BSE graduate students, faculty, and staff to compile relevant information. The information is separated by "new" and "current" students; however, information from both sections is applicable to all BSE graduate students, whether you're just starting or have been here 3+ years! This resource list is not exhaustive, if you have recommendations of additional items to include or general questions, please reach out to the GSO Officers.

A. NEW STUDENTS

I. GENERAL UNIVERSITY INFORMATION

Student Fees

Be aware of the student fees charged each semester (~$1,400/semester). These fees apply to all students on GRA, GTA, and GA assistantships.

More information:
- https://graduateschool.vt.edu/admissions/tuition-and-costs.html

Getting Your Student ID

You must go in person to the address below to get your student ID (Hokie Passport). Your Hokie Passport can be used to obtain swipe access to rooms and buildings that are closed to the public after certain hours.

Hokie Passport Services Student Services Bldg, 800 Washington St., SW Suite 100, Virginia Tech, Blacksburg, VA 24061

More information:
- https://www.hokiepassport.vt.edu/pages/getyourcard.php?div2=Student#:~:text=The%20ID%20request%20cards%20are,but%20replacement%20IDs%20cost%20%2425.

Immunization History Form

All students are required to submit an immunization history form when they first start at the university. See information and forms at the links below.

Forms:
- https://healthcenter.vt.edu/content/dam/healthcenter_vt_edu/assets/docs/immunizationhistory_form.pdf

More Information:
- https://healthcenter.vt.edu/new_student/required_immunizations.html

Health Insurance

Students funded 50% or greater on GTA, GRA, or GA qualify for Aetna health insurance through the university. Enrollment usually goes from mid-July to early-September. You will enroll as "Subsidy Eligible Graduate Assistants". External fellowships do not count as university assistantships. BSE has found workarounds to this for NSF GRFP fellows, contact Graduate Program Director (Cully Hession) with concerns about healthcare on external fellowships.

Links from VT website:
- https://graduateschool.vt.edu/funding/types-of-funding/assistantships/benefits.html
- https://risk.controller.vt.edu/studentmedicalinsurance.html
  - o This link has lots of PDF's that break down medical and dental coverage and costs, how to enroll, etc.
- Aetna website: https://www.aetnastudenthealth.com/en/school/474968/index.html

Steps for Transferring Residency
Transferring your residency will help reduce student fees each semester. There is usually a waiting period before the graduate school will officially change you over to in-state (~1 year).

1) Complete In-State Tuition Request form
   a) https://graduateschool.vt.edu/content/dam/graduateschool_vt_edu/GAAPforms/In-State_Tuition_Request.pdf
   b) https://graduateschool.vt.edu/admissions/tuition-and-costs/in-state-tuition-and-residency.html
2) Apply for VA Driver's License at DMV
   a) https://www.dmv.virginia.gov/drivers/#applying.asp
   b) https://www.dmv.virginia.gov/webdoc/pdf/dmv141.pdf
   c) Local DMV address: 385 Arbor Dr NE, Christiansburg, VA 24073
   d) Required documents:
      i) Proof of identity (birth certificate, passport, social security card)
      ii) Proof of legal presence (VT pay stub) (may or may not be requested)
      iii) Proof of VA residency (2 required)
         (1) Deed, mortgage, rental/lease agreement
         (2) US Postal Service change of address confirmation
             Utility bill (not more than 2 months old)
         (3) Billing statement
   e) Title/register your car in VA (optional)
   f) Register to Vote in VA (optional)

Tips for International Students
- The Cranwell International Center has lots of information related to immigration and required documents. Online immigration services are also offered on this website: https://international.vt.edu/Immigration-Services/IntlHokies.htm.
- **Visa**: You will need an F1 or J1 Visa as an international student and processing time for these visas varies from country to country. International BSE graduate students

recommend that you apply for the visa as soon as possible after receiving acceptance to the school and department.

- **Health insurance**: Additionally, watch your email for information related to health insurance.
- **Community**: BSE international students have used [GobblerConnect](#) to build community through various international student organizations. Some examples are listed below:
    - Association for Bangladeshi Students at Virginia Tech
    - Indian Students Association
    - Bengali Students' Association
    - Association of Chinese Students and Scholars at Virginia Tech
    - Korean Student Association
    - Iranian Society at Virginia Tech
    - Nepalese Student Association
    - Thai Student Association at Virginia Tech
    - Brazilian Student Association at Virginia Tech
    - Egyptian Student Association
- **Weather**: Blacksburg has cold winters and moderate amounts of snow, so you'll definitely want to bring/purchase a winter coat. The summers can be hot/humid - basically, we get all four seasons of weather.
- **Social Security Number**: If you need to visit the Social Security Office, it's located in Roanoke, VA (612 S Jefferson St. #100, Roanoke, VA 24011)
- **Transportation**:
    - **Driving**: If you want to get a driver's license and do not currently have a valid driver's license, you will first need to apply for a learner's permit. If you already have a valid driver license from your country, the learner's permit could be waived. You can then apply for a VA Driver's license directly. For more information about applying for VA driver license [here](#).
    - Transportation to Blacksburg/Campus upon arrival:
        - Virginia Breeze through Megabus from Dulles Airport in DC and IAD airport (requires 2 tickets if you have 2 bags)
        - [Smartway bus](#) from ROA airport to Blacksburg (ticket costs $4, cash only).
        - You can also use Lyft or Uber if traveling from Roanoke. The ride from the Roanoke airport to Blacksburg costs $60-$80.
        - See [Traveling Around Town/NRV section](#)

II. GETTING SET UP IN THE BSE DEPARTMENT
Setting Goals and Expectations with Your Advisor
- You should meet with your advisor on a regular schedule, ask them how frequently they would like to meet

- Do they want to meet with you one-on-one or as part of a lab group meeting?
- Ask how they want you to communicate with them (email, Slack, phone, etc.)
- Do they have specific goals and a timeline for accomplishing degree milestones?

Graduate Student Profile on BSE Website

BSE graduate students are encouraged to submit a profile on the BSE website that showcases your previous institutions, research publications, grants, teaching experience, etc. The Graduate Program Coordinator (Liza Spradlin, lizaas14@vt.edu) has the form for graduate students to fill out and completed forms can be sent to the BSE Communications Specialist (Cameron Warren, cameronrw@vt.edu).

Desk Assignments

There are graduate student offices located in Seitz 214, Agnew 200, and HABB1 301/302. Ask your advisor and/or current students in your lab group which building might be ideal based on your research group. For example, Bioprocessing students typically have desks in HABB1 and Watershed Science students have desks in Seitz or Agnew based on where their research labs are located. Contact the Graduate Program Coordinator (Liza Spradlin, lizaas14@vt.edu) for desk assignments.

IT Resources

- To get a computer/monitor/laptop, talk with your advisor about what type of computer will best suit your needs and then contact the BSE Computer Systems Engineer (Denton Yoder, denton@vt.edu)
- How to print
- VPN & Network Password
  - VPN departmental information
  - General VPN information from Virginia Tech
- Connecting to On-Campus WiFi (eduroam)
  - The password to connect is different than your PID password (what you use to log into HokieSpa, Canvas, etc.) and must be generated within HokieSpa from your Account Information
  - There will be a 'Network Password' link that generates a new password for you to enter when connecting a new device
  - Instructions found here: https://www.nis.vt.edu/ServicePortfolio/Network/Wireless.html
- BSE IT link: https://sites.google.com/a/vt.edu/bse-internal/home

Trainings

Consult your advisor and/or designated lab manager for trainings specific to your lab or fieldwork. Most general trainings are assigned via the Environmental Health and Safety system: https://www.ehss.vt.edu/training/.

Before working in the lab, you must take the following trainings:
1) General Laboratory Safety
2) Personal Protective Equipment Awareness

Bioprocessing labs may also require these trainings:
1) Biosafety for Research Labs
2) Introduction to Biological Safety Cabinets
3) Overview of the NIH Guidelines and VT IBC
4) Bloodborne Pathogens

Lab managers (More information in Departmental Contacts section):
1) Seitz Labs: Laura Lehmann
2) HABB1 Labs
   a) Bioprocessing: Cora Chen
   b) Water Quality Lab: Kelly Peeler

Financial Questions
Any financial questions (setting up direct deposit, submitting travel reimbursements, etc.)
should be directed to the BSE Financial Analyst (Matthew Bright, msbright8@vt.edu).

Get in Contact with Current BSE Grad Students
Ask about our Slack channel (BSE-grads) and Facebook messenger group chat! The Graduate
Student Organization will send out emails for upcoming BSE events – attending these events is
a great way to get to know other students in the department.

Follow BSE on Social Media
- Facebook
  - BSE GSO
  - StREAM Lab
- Instagram
- Twitter

Other things to anticipate
- You'll be required to submit an annual report signed by your advisor and committee
  members detailing your degree progress. The Graduate Program Coordinator (Liza
  Spradlin) will email all graduate students about annual reports every year.
- Assistantship contracts may be for 9 months (academic year only) or 12 months
  (including summer). Many BSE students have 9 month contracts but will typically
  receive additional summer funding. We recommend talking with your advisor about
  summer funding.

III. REGISTERING FOR CLASSES
Most advisors will recommend that new graduate students register for classes within the month
before classes begin. The Web Add/Drop opens about a month before the semester begins on

HokieSPA. Don't be too concerned about not getting into the classes you want to take, usually there is still space in graduate level courses at this time. You can see available classes on the Timetable in HokieSPA. Additionally, students can use Course Pickle to watch for openings in classes and Anaanu to see additional information about VT courses. See the "Current Student Section" below for other courses recommended by current BSE graduate students.

If you are on assistantship, you are required to be enrolled in 15 credits. This is a requirement of the BSE department to ensure you reach full-time student status (so it doesn't impact your stipend payments). This also helps to ensure that you reach the necessary amount of research credits required by the Graduate School. After you have registered for your chosen classes/seminars, MS students register for "Research and Thesis" (BSE 5994), MEng students register for "Project and Report" (BSE 5904), and PhD students register for "Research and Dissertation" (BSE 7994) with your advisor as the instructor. You can then manually set the number of credits for BSE 5904/5994/7994 to reach a total of 15 for the semester. If you're unable to edit the credits manually, contact the Graduate Program Coordinator (Liza Spradlin, lizaas14@vt.edu) and she can edit it for you.

Your first semester, you will be expected to take:

1) BSE Seminar (BSE 5944). The BSE department has a 1 credit class both Fall and Spring for incoming MS and PhD students. Fall semester focuses on navigating the department and grad school overall; Spring semester has typically had more external speakers.
2) Graduate Student Success in Multicultural Environments (ENGE 5304): The Graduate School requires that all students take this half-semester long P/F course. You can choose to take it in the first half or the last half of the semester.

For students who have a non-engineering BS degree: The BSE department requires that both MS and PhD grad students take (1) fluid mechanics and (2) thermodynamics. These courses can be taken at the undergraduate or graduate level and can be taken at any university (including community college). If you elect to take these courses at Virginia Tech, you might be required to take prerequisite courses before enrolling (e.g., Calculus 3). You may be able to skip prerequisite courses if you get permission to enroll from the fluids/thermodynamics professor. If you take the courses at another university, you will be required to pay for them out-of-pocket. The classes don't need to transfer to Virginia Tech for course credit and there's no approval process for submitting course completion documentation. You simply must take one thermodynamics and one fluid mechanics class anywhere any time before you graduate to check the boxes on your plan of study. Previous BSE students have opted to take these classes at community college and online over the summer to bypass prerequisite requirements. This website assists in searching for community college classes offered anywhere in Virginia.

IV. LIVING IN BLACKSBURG AND THE NEW RIVER VALLEY
Housing Options

Vacancies will start to open up in December and January for the following fall (leases typically start in August). There are multiple apartment complexes and houses for rent within a five mile radius of campus and there are frequent bus routes. Some graduate students also prefer to rent outside of town, such as in Christiansburg. Rent varies depending on if you want to live alone or share a place with roommates. A single place will typically cost $700 - $1,200 per month depending on the location. For example, single apartments further away from campus or in Christiansburg tend to be closer to $700 but singles near campus may be $1,000. If you want to live with roommates, rent will usually be $400 - $800 per month. Previous students have encountered issues if they live in the same residence as the landlord so we recommend you avoid living with your landlord. International students can connect with their respective communities on Gobbler connect to identify roommates. **Students should start to look for housing as soon as they are accepted into BSE!**

Websites for finding housing and/or roomates:
- Virginia Tech graduate student on-campus housing
- Tech off campus
- Virginia Tech Housing, Sublets, and Roommates (Facebook page)
- Craigslist
- Zillow (for rent by owner will usually be less expensive)

Local places to furnish your living space:
- Craigslist
- Virginia Tech Buy-Sell-Trade Facebook page
- Goodwill
- YMCA Thrift store
- Local department stores: Bed Bath and Beyond, Sleep Mattress and Furniture, TJ Maxx, Ross, etc.

Apartment complexes/Townhomes to consider:
- Hearthstone Apartments
- Hethwood & Foxridge (near StREAM Lab)
- Ridgewood Village (near S Main St)
- Crossing at Knollwood (CRC)
- Cedarfield (CMG owns - quiet, Ellett Road)
- Jefferson Apartments
- Oak Tree townhomes (Christiansburg)
- The Highlands at Huckleberry Ridge (Between Blacksburg and Christiansburg, quiet, new apartments, no VT bus access/you need a car)

Rental companies to consider:
- Townside Property Management
- Pointe West Management
- CMG Leasing
- HHHunt (owns Foxridge and Heathwood)

- VIP Rental (Christiansburg, single family homes)

Rental companies to avoid:
- Raines Property Management
- Tnt Flinchum

Traveling Around Town/NRV
- Blacksburg Transit bus routes and app (http://ridebt.org/) – provides service to Blacksburg and Christiansburg
- Smartway Bus connects to Roanoke/Airport
- To purchase university parking permits: https://parking.vt.edu/

Healthcare Locations
- Schiffert Health Center (on VT campus)
- Carilion Clinic Family Medicine
- LewisGale Family Physicians (South Main Street)

V. OTHER CONSIDERATIONS FOR NEW STUDENTS
Committees
- How to identify potential committee members
    - PhD students are required to have at least four committee members, including your advisor. At least one needs to be from BSE (this does not include your advisor), and one external to the department (this person could be in another department or outside of Virginia Tech).
    - MS students are required to have at least three committee members, including your advisor. The other two committee members can be from BSE or external to BSE.
    - Students can consider being co-advised if they are transdisciplinary, or if the advisor typically works closely with another faculty member. This will need to be discussed with the advisor(s).
    - Ensure potential committee members have good working relationships between professors. This could include past collaborators of your advisor or other professors on your project grant.
    - Identify someone who will support you to reach your research goals (potential co-authors).
    - Try to meet with a potential committee member face-to-face to discuss if they will be a good fit for your committee (typically by the 2nd semester for MS and 3rd semester for PhD).
- How to have your first committee meeting
    - When contacting committee members to schedule your first committee meeting, include a draft of your prospectus, plan of study, and a when2meet or doodle poll
    - During the meeting:
        - Give committee members some background on your past experiences

- Provide background on your research project and questions you're interested in exploring
- Discuss timeline for your degree/outlining your goals
- Questions you have for the committee
- We recommend making a PowerPoint to guide meeting discussion

Identify a Citation Manager
- [Library resources](#)
- Mendeley (free, always)
- EndNote (free to VT students)
- Zotero (free up to 300 MB). This [storage](#) will fill up fast if PDFs, snapshots and other attachments are included. Just storing citations takes up little space.

VT Student Organizations
The BSE department has 3 main student organizations: the Graduate Student Organization (GSO), Alpha Epsilon (honor society), and the American Society of Agricultural and Biological Engineers (ASABE). GSO will host social and volunteer events each semester that all BSE graduate students are welcome to participate in! You can find other organizations on [GobblerConnect](#) and there is a large involvement fair on the Drillfield each fall semester. The graduate school sends out weekly emails with events and resources for graduate students.

GTA Assignments
Students funded through a Graduate Teaching Assistantship will get their course assignments about one week before the semester starts. You should receive a form from the department that will help match you to applicable courses (no guarantees). GTAs are required to take the 1 credit GRAD 5004 GTA Workshop.

B. CURRENT STUDENTS

I. COURSES APPLICABLE TO BSE STUDENTS
In addition to the [BSE course requirements](#), some advisors have specific classes they want their students to take or may provide suggestions based on your career goals. We recommend that you discuss courses with your advisor each semester. If your advisor doesn't have many suggestions, refer to the list of classes below that previous BSE grad students have found to be either (1) useful to students for research/career knowledge or (2) enjoyable teaching/content.

*For additional feedback on specific courses and instructors, see reviews on [RateMyProfessor](#).

- You can add to RateMyProfessor using the following steps:
    - Search for professor by name and university on RateMyProfessor
    - Add your review and please include the following information:

- Year and semester of the class
- What you liked about the class
- What you did not like about the class
- Please also indicate your grade received, and if you had to buy the textbook

Course List by Discipline
- Bioprocessing
  - BSE 5564G Metabolic Engineering
  - BSE 5614 Advances in Recombinant Protein Production
  - BSE 5444 Protein Separation
  - BSE 5504G Bioprocess Engineering
- Hydrology
  - BSE 5984 Fluvial Geomorphology
  - BSE 5364 Stream Restoration (Fluvial is a prerequisite)
  - CEE 5344 Surface Water - Groundwater Interaction
  - CEE 5384 Advanced Open Channel Flow
  - CEE 5314 River Mechanics and Sediment Transport
  - CEE 5304 Environmental Fluid Mechanics
  - CEE 5334 Quantitative Hydrology
- Biogeochemistry
  - FREC 5984 Adv. Wetland Hydrology and Biogeochemistry
  - FREC 5354 Soil Science and Biogeochemistry
  - BIOL/FREC 5034 Ecosystem Dynamics (R coding)
- Spatial
  - FREC 6214 Forestry Lidar Applications
  - GEOG 5384 Programming for GIS (Python coding in ArcGIS Pro)
  - GEOG 5984 Digital Terrain Analysis (Paper discussion-based course)
  - GEOG R Programming for Geospatial Applications (Extremely clear instructions from Dr. Yang Shao)
  - BSE 5344 Applied GIS
- Math/Stats (and BSE approved equivalents)
  - CEE 5724 Environmental Monitoring and Sampling (R Coding)
  - FREC 5244 Advanced Hydroinformatics (R coding)
  - STAT 5615/5616 Statistics in Research (Nice basic intro to stats course)
  - BSE 5004 Engineering Math (Basic MatLab applied to engineering)
  - BSE 5304G Advanced Watershed Modeling
  - [CEE 5984 Data Analysis for Environmental Science and Engineering](#)
- Lab techniques
  - SPES Microbial Community Analysis
- Field techniques
  - BSE 5224G Field Methods in Hydrology
  - FIW 5534G Adv Ecology and Management of Wetland Ecosystems
  - ENT/BIOL/FIW 4484 Freshwater Biomonitoring
- Coding/modeling classes

- - BSE 5304G Advanced Watershed Modeling (R coding)
    - FREC 5244 Advanced Hydroinformatics (R coding)
    - ME 5984 Applied Machine Learning (Python coding)
  - Teaching
    - FREC 5984 College Teaching in Natural Resources
    - GRAD 5104 Preparing the Future Professoriate
    - GRAD 5114 Pedagogical Practices in Contemporary Context
    - GRAD 5144 Communicating Science

  - Grant writing
    - BIOL 5174 NSF GRFP Prep
    - ALS 5094 Grant Writing
  - Seminars
    - FREC 5104 Remote Sensing & GIS
  - Classes required for students with non-engineering bachelor's degrees
    - Fluid mechanics
    - Thermodynamics

BSE Math/Stat Equivalent Courses
[BSE keeps a list](#) of courses offered that will count towards the required Math/Statistics credits. Graduate students may request a new math/stat equivalent by emailing the Graduate Program Director (Cully Hession, chession@vt.edu) and the Graduate Program Coordinator (Liza Spradlin, lizaas14@vt.edu), and submitting the syllabus for the class.

Virginia Tech Certificates
Virginia Tech certifications allow students to become experts in certain disciplines and/or techniques in addition to receiving a graduate degree. Think of a certification almost as a minor. Graduate students can easily earn at least one certification by strategically planning their class schedule early. Once earned, these certifications can be added to one's CV under their education section.

- See list of certificates [here](#)
- Fill out [this form](#) indicating intent
- Fill out [this form](#) when you have taken all classes for the certificate
- You will have to pay $25 to get a paper diploma and $5 for an e-diploma

II. SUGGESTED DEGREE TIMELINE
The following degree timelines are general suggestions, the timelines are not rigid. Some advisors will have very specific dates for completing goals, while others will not provide any. Use these suggested timelines to estimate if you are on track with your degree based on the expectations and goals you've established with your advisor. Links to departmental [forms](#) and [academic requirements](#). The following link contains steps from Virginia Tech for completing your degree, along with [deadlines for academic progress](#).

Accelerated BS/MS Students (4 yrs for BS + 1-1.5 yrs MS)
- First semester (first semester of senior year)
  - Identify research project
    - Brainstorm how you intend to answer your research question(s) - is it lab work? Field work? Modeling? What resources or site visits will you need to accomplish your goals?
  - Start your literature review
    - Review literature to identify research questions and build background knowledge
      - Take notes as you read and/or write a summary of the major takeaways from the paper! Can be especially helpful if your advisor wants you to write a literature review.
      - Use a citation manager
  - Establish goals and expectations with advisor
  - Start to develop plan of study
- Second semester (second semester of senior year)
  - Finalize and finish your literature review
  - Will most likely be very busy with senior design project
- Summer after graduation from undergraduate degree
  - It is best NOT to do an internship during this time so that you can continue/start your research, with the goal of trying to complete your research by the end of summer.
    - If you'd like to seek an internship, discuss this with your advisor and committee ahead of time
  - Begin writing your methods section
  - Start to ask professors about being on your committee
- Third semester (start of 5th year)
  - Review graduation requirements and note all deadlines
  - Form your committee
  - Have your first committee meeting
  - Write your thesis proposal/research prospectus (degree of formality varies depending on advisor expectations)
    - Usually a 1-2 page document outlining what you plan to research
    - Example found here
  - Complete and submit official plan of study to Graduate Program Coordinator (Liza Spradlin)
    - Graduate Program Coordinator sends to graduate school
    - Keep an eye on HokieSPA's "degree menu" → "graduate student checklist" to make sure plan of study got approved by grad school
  - Complete your methods section
  - Finish research
- Fourth semester
  - Write your discussion, results and conclusion sections by the end of January
  - Write thesis and go through iterative edits with your advisor
    - Adhere to ETD guidelines from the Graduate School

- o Give your committee your thesis before the deadline to defend (Final exam deadline found [here](#)).
- o Apply for your degree in HokieSPA
- o Schedule your defense at-least 2 weeks in advance (thesis is also due to committee 2 weeks in advance of defense date)
  - ▪ Make sure you know how to use [Ithenticate](#)
- o After your defense, you have 2 weeks to make edits to your thesis and submit the final copy to the graduate school

Master's Students (2-2.5 year degree)
- ● First semester
  - o Establish goals and expectations with advisor
  - o Develop [plan of study](#)
  - o Review literature to identify research questions and build background knowledge
    - ▪ Take notes as you read and/or write a summary of the major takeaways from the paper! Can be especially helpful if your advisor wants you to write a literature review.
    - ▪ Use a citation manager
  - o Begin to identify potential committee members / have your first committee meeting towards the end of the semester
  - o Brainstorm how you intend to answer your research question(s) - is it lab work? Field work? Modeling? What resources or site visits will you need to accomplish your goals?
- ● Second semester:
  - o Have your first committee meeting early in the semester if you didn't fit it in the first semester
  - o Write your thesis proposal/research prospectus (degree of formality varies depending on advisor expectations)
    - ▪ Usually a 1-2 page document outlining what you plan to research
    - ▪ Example found [here](#)
  - o Submit official plan of study to the Graduate Program Coordinator (Liza Spradlin)
    - ▪ Graduate Program Coordinator sends to graduate school
    - ▪ Keep an eye on HokieSPA's "degree menu" → "graduate student checklist" to make sure plan of study got approved by grad school
- ● Summer:
  - o 2 year MS students will not typically participate in summer internships
    - ▪ If you'd like to seek an internship, discuss this with your advisor and committee ahead of time
  - o Summer is an ideal time to run experiments, do fieldwork, collect data, etc.
- ● Third semester:
  - o Review [graduation requirements](#) and note [all deadlines](#)
  - o Continue collecting and analyzing data
  - o Keep your committee up to date with your research progress
  - o Start planning out the pieces that will make up your thesis
- ● Final semester:
  - o Finalize data analysis

- o Write thesis and go through iterative edits with your advisor
  - ▪ Adhere to ETD guidelines from the Graduate School
- o Apply for your degree in HokieSPA
- o Schedule your defense at-least 2 weeks in advance (thesis is also due to committee 2 weeks in advance of defense date)
  - ▪ Make sure you know how to use Ithenticate
- o After your defense, you have 2 weeks to make edits to your thesis and submit the final copy to the graduate school

PhD Students (3 - 6 year degree, length varies)

PhD length will varying depending on if a student already has their MS or is direct to PhD (no MS). PhD students should plan to conduct research during all summers (run experiments, do fieldwork, collect data, etc.). PhD students have participated in summer internships, but this will need to be discussed with your committee.

- First year
  - ○ Establish goals and expectations with advisor
  - ○ Develop plan of study
  - ○ Review literature to identify research questions and build background knowledge
  - ○ Begin to identify potential committee members / have your first committee meeting towards the end of the year
- Second year
  - ○ Complete your thesis proposal/research prospectus (degree of formality varies depending on advisor expectations)
    - ■ Complete literature review
  - ○ Have a committee meeting to approve your Plan of Study and prospectus
  - ○ Schedule and/or study for prelims (goal to take prelims at the end of 2nd year or beginning of 3rd). More information about prelims can be found in the Preliminary Exam Expectations section
    - ■ Ensure Graduate School has approved Plan of Study and prospectus
  - ○ First dissertation chapter on it's way to completion
- Third year
  - ○ Review graduation requirements and note all deadlines
  - ○ Second dissertation chapter
  - ○ Annual committee meeting
  - ○ Attend a conference if you haven't already! (See travel award section)
- Fourth year + beyond
  - ○ Review graduation requirements and note all deadlines
  - ○ Third and any additional chapters of dissertation
  - ○ Annual committee meeting
  - ○ Apply for your degree in HokieSPA
  - ○ Write dissertation and go through iterative edits with your advisor
    - ■ Adhere to ETD guidelines from the Graduate School

- Advisor/committee might allow already published chapters to be inserted into dissertation
  - Schedule your defense in HokieSPA at-least 2 weeks in advance (dissertation also due to committee 2 weeks in advance of defense date)
    - Make sure you know how to use [Ithenticate](#)
      - Ithenticate can be forced to ignore certain sections of your dissertation that have already been published. For questions, please review the [Ithenticate webpage](#).
  - After your defense, you have 2 weeks to make edits to your dissertation and submit the final copy to the Graduate School

Plan of Study & Research Prospectus

A [Plan of Study](#) will include your anticipated coursework, credits, and research prospectus. Your Plan of Study will need to be approved by your committee members and the Graduate School. There are no formal requirements for the Research Prospectus format. The minimum length is usually 2 pages (MS), but can be up to 15+ pages (PhD). Some advisors will want you to lay out your research questions, approach, and anticipated hypotheses.

Preliminary Exam Expectations

Preliminary Exams expectations will vary from committee to committee. Previous BSE PhD students recommend that you meet with your committee members ahead of time to ask questions like: what materials you should review, will the exam be open note or closed notes, how much time is given per problem, etc. Previous BSE students have had 1 written question per committee member (8 hrs/question), then a one to two week break for the committee to review answers, followed by a 2-3 hour oral exam where the committee asks questions about written answers and any other topics. It's best to schedule prelims over the fall or spring semesters to avoid paying a summer fee. BSE is actively working to standardize this process.

BSE students have had a range of questions on their prelim exams, including:
- Defending planned research written in the student's prospectus/proposal
- Related to research already completed
- Potential future research topics/avenues (i.e., what would the next natural steps be to expand your dissertation research?)
- Data analysis (i.e., processing collected data, discussing observed trends and why these trends might be occurring)
- Proposal writing (i.e., write a research proposal based off of an external prompt from various funding agencies)
- Fundamental topics covered in courses

Defending Over the Summer / After VT Deadlines

If you are defending after the [deadlines for the current semester](#) or over the summer submit a [start of semester defense exception request form](#). This will enroll you in 1 credit to make you

eligible to defend. If you're doing this over the summer, you're responsible to pay for the 1 credit (~$1,000 for out-of-state students)

Switching Degree Status
If a student defends an MS and wants to continue for a PhD (staying in BSE) or if a student wants to switch from MS to PhD (or vice versa), fill out a change of degree status form and submit to graduate school. Students continuing from MS to PhD within the same department are not required to re-apply for graduate admission. Students who complete an MS within the Department can transfer 50% of coursework towards their PhD.

Details of Transferring MS Coursework to PhD
- BSE students can transfer 50% of MS coursework
- Can transfer any BSE classes towards the required 3 BSE courses
- Can transfer BSE Seminar
- Classes that fulfilled the math/stats for MS can also be transferred and applied to PhD
- Plan of study must be approved by your committee and the Graduate Program Director and Graduate Program Coordinator

Checklist for Graduating
- Watch deadlines set by Grad School each semester
- Apply for degree in HokieSPA
- Pay any university fees
- Know how to use ithenticate
- Ensure Grad School has approved your Plan of Study
- Submit thesis/dissertation to committee (due 2 weeks before defense)
- Schedule defense
- Submit final ETD to grad school (due 2 weeks after defense)

III. DEPARTMENT EQUIPMENT, RESOURCES, AND CONTACTS

Contact (Name, email, office)	Manages	Point of Contact For
Matthew Bright msbright8@vt.edu Seitz 203	• Financial Analyst	• Submitting travel reimbursements • Direct deposit / financial questions • Access to Hokiemart
Cora Chen ychen12@vt.edu 100 Agnew / 301H HABB1	• 100 Agnew Unit Ops Teaching Lab • Bioprocessing Labs in HABB1	• Use of Bioprocessing lab equipment • Lab emergencies (spills, accidents, etc.) • General safety questions related to research and waste handling in HABB1 labs

Laura Eanes lheanes@vt.edu 200A Seitz	● Administrative Assistant to the Department Head	● Reserving rooms in HABB1 and Seitz ● Scheduling meetings with the department head
Laura Lehman lauteany@vt.edu Seitz 111	● Seitz watershed science research labs ● BSE teaching labs in Seitz ● Field research labs/site ● BSE Vehicle Service Center ● StREAM Lab	● Field equipment training, use, scheduling, and safety ● Reserving BSE vehicles ● Facilities issues ● Lab emergencies (spills, accidents, etc.) ● General safety questions related to research and waste handling in Seitz and field laboratories
Kelly Peeler kapeeler@vt.edu 302H-HABB1	● Water Quality Lab in HABB1	● Questions about analyzing research samples through the WQL (Nutrients, Carbon, Anions/Cations, Water Isotopes, etc.) ● General safety questions related to research and waste handling in WQL and HABB1 ● Lab emergencies (spills, accidents, etc.)
Teresa Smith tlcox@vt.edu 202 Seitz	● Fiscal and Administrative Support Specialist	● Handles reimbursements ● Handles keys ● Paper for printing
Liza Spradlin lizaas14@vt.edu 208 Seitz	● Graduate Program Coordinator	● Graduate assistantships contracts ● Graduate paperwork ● Submitting plan of study ● General graduate program questions
Cameron Warren cameronrw@vt.edu 210A Seitz	● Communications Specialist	● Graduate student website biographies
Allen Yoder akyoder@vt.edu 302 Seitz	● Field research technician/ project fabrication technician	● Assistance with field work/ setting up equipment ● Assistance with fabrication of custom items for research projects (Metal/plastic welding, materials cutting, etc.) ● Lab emergencies in Seitz (if Laura is not available or reachable)
Denton Yoder denton@vt.edu	● BSE Computer Engineer	● IT questions ● Department issued computers

106 Seitz		● Printing conference posters

IV. GRANTS, FELLOWSHIPS, SCHOLARSHIPS, AND RESEARCH EXPERIENCES

* indicates that BSE graduate student(s) have received this funding before

General Internal

- VT Graduate School Funding information
- VT Graduate School Student-initiated Fellowships and Scholarships
- VT Graduate Research Development Program
  - Administered by the Virginia Tech Graduate and Professional Student Senate (GPSS) to provide monetary support for degree-contingent research conducted by Virginia Tech graduate students. Awards range from $1,000 to $2,000.
- Interdisciplinary Graduate Education Programs
  - Interfaces of Global Change*
    - Rural Environmental Health Fellowship*
  - Remote Sensing*
  - Infectious Disease*
- Institute of Critical Technology and Applied Science (ICTAS)
  - ICTAS Doctoral Scholars Program
  - Roop and Kavita Mahajan Research Awards
- George Washington Carver Assistantship Program*
- VT Scholarship Central
  - Fill out a general application to be eligible for multiple scholarships

General External

- National Science Foundation Graduate Research Fellowship Program*
- Pathways to Science
  - At the moment, PathwaysToScience.org has over 70 portable scholarships and fellowships posted on the site. These include undergraduate, graduate, and postdoc level funding opportunities with an emphasis on increasing diversity in STEM.
  - Graduate fellowships and resources for applying: https://pathwaystoscience.org/Grad.aspx
  - A quick video tutorial on using our advanced search functions to find funding opportunities: https://www.youtube.com/watch?v=FxKsAGk8dAw&t=16s
- Hertz Fellowship
- Ford Foundation Fellowship*
- Sigma Xi Grants
  - Grants of up to $1,000 to students from most areas of the sciences and engineering
- National Science Foundation International Research Experiences for Students*
- ASABE Scholarships

Watershed Science External
- [Virginia Water Resources Research Center](#)*
  - [William R. Walker Graduate Research Fellow Award](#)
    - ▪ Intended for individuals pursuing graduate work in water resources who have an undergraduate degree that did not have a water resources emphasis or individuals with professional work experience returning to graduate school to study water resources.
- [Virginia Space Grant Consortium](#)*
- [Virginia Sea Grant](#)
- [AGU Robert E. Horton Research Grant](#)
  - [Other AGU Grants](#)
- [Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI)](#)
  - Hydroinformatics Innovation Fellowship
  - Instrumentation Discovery Travel Grant*
  - Pathfinder Graduate Student Fellowship
  - Voices of the Future
  - [National Water Center Innovators Program: Summer Institute](#)

Geospatial External
- [American Society for Photogrammetry and Remote Sensing (ASPRS) student scholarships and awards](#)

Agriculture External
- [Sustainable Agriculture Research and Education](#)*
- [Virginia Crop Production Association Scholarships](#)
  - Has been administered by Dr. Scott Hagood (shagood@vt.edu) in the past

Bioprocessing Internal
- [Fralin Commercialization Fellows Program](#)

Bioprocessing External
- [National Institute of Food and Agriculture, USDA](#)
  - [Agriculture and food research initiative (AFRI)](#)
  - [Plant Breeding, Genetics and Genomics Programs](#)
  - [Sustainable Agriculture Program](#)
- [Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowship (NNF) Grants Program](#)
- [Good Food Institute: Alternative protein research grants](#)
  - Funds open-access alternative protein research
- [Merck KGaA research grants program](#)
  - Drug Discovery, Real time testing and sensors, Nanoparticles for nucleic acid delivery, Sustainability, etc.

Travel Awards

- Julia K. Pryde Memorial Scholarship
  - Funds international travel for VT BSE undergraduate and graduate students
  - Apply through the VT [online portal](#). Search for the specific scholarship in the search bar.
- [Supplemental Travel Awards for VT BSE Graduate Students](#)
  - To be eligible for a travel award, a student must be:
    - Enrolled full-time as a graduate student in BSE and
    - Present a paper or poster at a national/international conference.
  - The maximum allocation awarded per conference will be $600.
    - Masters students may receive up to a total of $1200 in BSE Supplemental Travel Awards during their MS degree program.
    - Ph.D. students may receive up to a total of $2400 in BSE Supplemental Travel Awards during their PhD degree program.
- [VT GSA Travel Fund Program](#)
- [AGU](#)

Navigating Taxes and Health Insurance for External Fellowships

If you are awarded an external fellowship, you're not considered an employee of Virginia Tech. Because of this, state and federal taxes will not automatically be deducted from your pay each month. You will be responsible for paying your estimated state and federal taxes. [This article](#) contains helpful suggestions about paying estimated taxes. To be eligible for health insurance, the BSE department has previously offered students on external fellowships a ½ assistantship which qualifies students as employees of VT. We recommend you work with the department head (Dr. Edwards), the graduate program director (Dr. Hession), and your advisor if you receive an external fellowship.

V. RELEVANT LISTSERVS

General

- glc-programs-g@vt.edu

Watershed science

- vastreams-g@vt.edu
- bse-wse-stu-g@vt.edu
- gilbertclub@lists.berkeley.edu ([link](#))
- water-g@vt.edu
- vthydro_grads-g@vt.edu
- vt-biogeochemistry-g@vt.edu
- Consortium of Universities for the Advancement of Hydrologic Science ([CUAHSI)](#)

VI. OTHER RESOURCES

Information for GTAs

From the Graduate School:

GUIDE CREATED BY GRADUATE STUDENTS AVAILABLE FOR DOWNLOAD: The Graduate Engineering Mechanics Society (GEMS) and associates from VTGrATE and MEGSC are proud to present the GTA Guide: a guide written by graduate students for graduate students. It was written to complement the official training GTAs receive at Virginia Tech. It contains advice on balancing your work and life as a GTA, grading assignments quickly and effectively, holding good office hours, and potentially using your GTA position to start a career in teaching. It additionally starts with a table of quick references for resources useful to TAs and graduate students at Virginia Tech. The document can be viewed and downloaded at this link. If you have any questions or feedback regarding the guide, feel free to email Justin Dubik at jrdubik@vt.edu.

Other relevant campus 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
	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
	Ombudsperson
Other Professional Resources	Career Services LinkedIn Learning
Quality of Life Resources	Cook Counseling Center
	Graduate Life Center
	Schiffert Health Center
Student Legal Services	Student Legal Services at Virginia Tech
Cultural Community Centers	American Indian & Indigenous Community Center
	Asian Cultural Engagement Center

Black Cultural Center

El Centro – Hispanic and Latinx Cultural and Community Center

LGBTQ+ Resource Center

Women's Center

Other
Cranwell International Center

Services for Students with Disabilities

Veteran Services