



SBES Graduate Student Manual



Virginia Tech – Wake Forest University
School of Biomedical Engineering and
Sciences

Updated April 2023

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INTRODUCTION (Both Campuses)

Welcome to SBES

This handbook is intended to be a guide on the policies and procedures of the Virginia Tech – Wake Forest University School of Biomedical Engineering & Sciences (SBES) program.

Students admitted to the SBES program are responsible for following these policies and procedures as well as those of the respective Graduate Schools of each campus. (Wake Forest or Virginia Tech). These policies apply to ALL SBES students regardless of their campus location. Students should refer to the [Virginia Tech Graduate School Policies and Procedures](#) or to the [Wake Forest Graduate School Policies and Procedures](#).

Students are also reminded that they are being held to the highest standards of academic integrity, and thus are expected to adhere to the [Honor Codes of Virginia Tech](#) and the [Honor Codes of Wake Forest University](#). Failure to comply with these codes could result in dismissal from the SBES program and from the universities. Honor codes are published on the respective Graduate School websites. Even though SBES is a joint program, there are certain aspects of its operation that will require some differences in processes and procedures between the two campuses. This handbook presents a description of the basic program components that apply to all students regardless of campus, but it also contains some material that is campus-specific. Where applicable, certain topics are noted as applying to one campus or the other.

In general, the following content applies to all SBES students: general program description, admission categories, M.S., Ph.D. and combination degree descriptions, academic requirements, and progress to the degree steps. The content dealing with items such as registration, enrollment, grades, student accounts, insurance, and orientation are handled separately in chapters or sections devoted to a specific campus. Where applicable, some topics (e.g., financial aid) present information for both campuses together.

SBES Culture

As a biomedical engineering program, our mission and commitment are to increase the quality of life for patients and humankind. We're proud of our innovative, entrepreneurial, inclusive, and supportive culture. Through student organizations and alumni functions, we provide opportunities for engagement on campus and beyond. We are committed to fostering a diverse community of faculty, staff and students. We strive to recruit and graduate a high quality, diverse student body. We are committed to upholding the Virginia Tech motto, *Ut Prosim* – That I May Serve. We support these goals by listening to the needs and wants of the program community and formulating strategies for fulfilling these needs and wants. In alignment with the Virginia Tech College of Engineering's strategic plan, we confirm our commitment to those five core values of inclusiveness, excellence, integrity, perseverance, and stewardship. Our community supports equity and fosters respect for every individual, enabling collaboration and collegiality to permeate our classrooms, research facilities, and offices, and to extend to the broader university community. We recognize the importance of allowing every voice to be heard in a spirit of mutual respect. For more information: <https://beam.vt.edu/about/diversity.html>

Land acknowledgement:

We acknowledge the Tutelo/Monacan people, who are the traditional custodians of the land on which we work and live, and recognize their continuing connection to the land, water, and air that Virginia Tech consumes. We pay respect to the Tutelo/Monacan Nations, and to their elder's past, present, and emerging.

We also honor the land on which Wake Forest University now resides and the land on which the original campus resided. This land served for centuries as a place for exchange and interaction for Indigenous peoples, specifically Saura (saw-ra), Catawba (ka-tah-buh), Cherokee (chair-o-kee), and Lumbee (lum-bee) in this location and Shakori (shu-kor-ee), Eno (ee-no), Sissipahaw (sis-suh-pa-hah), and Occaneechi (oak-a-nee-chee) in the original campus location. Today Wake Forest continues to be a place of learning and engagement for Indigenous students, faculty, and staff regionally, nationally, and globally.

Virginia Tech Principles of Community (Adopted by SBES)

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 world 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 within the Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences program:

- **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, gender identity, gender expression, 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)*.

SBES Graduate Committee

The SBES Graduate Committee consists of the VT SBES Graduate Director, the WF SBES Graduate Director, 2 rotating faculty members from Virginia Tech SBES, and 2 rotating faculty members from Wake Forest SBES. In addition, the BMES Student Chapter elects 2 student reps from each campus (VT & WF) to hold representation positions but not voting duties in the committee along with the Department Heads from each campus, the graduate coordinator, and a program support staff member from Wake Forest. All policies in this handbook are approved by the SBES Graduate Program Directors and/or the SBES Graduate Committee. Changes to policies should be requested through the SBES Graduate Coordinator who will add them to the monthly agenda for the SBES Graduate Committee to discuss.

General Program Description

SBES is the Virginia Tech – Wake Forest University School of Biomedical Engineering & Sciences --- a fully joint graduate program formed in 2003 that brings together three prestigious academic units: the VT College of Engineering, the Wake Forest School of Medicine, and the VA-MD Regional College of Veterinary Medicine. Each of these separate entities contributes unique strengths to the combined enterprise so that students are offered a wide spectrum of first-class educational and research opportunities in a beautiful part of the country.

The SBES program has two campus locations. The first is at Virginia Tech in Blacksburg, Virginia and is home to the College of Engineering, the VA-MD Veterinary College and the Virginia Tech Carilion Research Institute. The second is at Wake Forest School of Medicine in Winston- Salem, North Carolina and is home to the Wake Forest University Baptist Medical Center which consists of the Wake Forest University Health Sciences and the North Carolina Baptist Hospital. Additional contributors to SBES also include the clinical departments at Wake Forest and the Department of Biomedical Engineering and Mechanics at Virginia Tech.

SBES is a graduate level only program offering the following degree programs:

- MS in Biomedical Engineering (both campuses)
- PhD in Biomedical Engineering (both campuses)
- DVM/PhD (offered through the Virginia Tech-Maryland Veterinary School)
- MD/PhD (offered through the Wake Forest University School of Medicine)
- MBA/PhD (offered through the Wake Forest University School of Business)
- UG/G (accelerated B.S./M.S. program offered at Virginia Tech)

The SBES curriculum currently consists of courses and research focused in broad areas of concentration which include but not limited to:

- Biomaterials
- Biomechanics
- Biomedical Imaging
- Cardiovascular Engineering
- Nanomedicine & Nanobioengineering
- Neuroengineering
- Tissue Engineering
- Translational Cancer Research
- Transportation Safety
- **And many more!**

Typically, a student's concentration area is directly related to the research specialty of the lab to which they are attached to. However, the final composition of an individual person's program is left in the hands of the student and their advisor and committee. This permits flexibility and individualization in the SBES graduate program structure.

One campus is chosen as the "home campus" but students have the opportunity to experience both environments and the faculty of each through courses taught by video broadcast and by inter-campus visits. Many research projects are collaborative efforts between faculty and students across the two locations. All PhD students experience a required Clinical Rotation course which allows students to visit clinical settings at both the Medical Center in Winston-Salem and various clinical settings near Virginia Tech.

Students successfully completing a graduate program in SBES will receive a joint degree from Virginia Tech and Wake Forest University. The diploma displays the names and seals of both institutions.

Details concerning the program can be found in this handbook as well as on our website at:

<https://beam.vt.edu/graduate/biomedical.html>

ORIENTATION (Both campuses)

This section of the handbook covers the basics for new students. An orientation website should be consulted for updated links and requirements each year and can be found at: <https://sbesorientation.weebly.com/> All SBES students (regardless of campus) are expected to begin the orientation steps listed on the SBES Orientation Website PRIOR to arriving! SBES students are expected to also check in with the SBES Graduate Coordinator upon arrival, but no later than the morning of orientation week. On the first day of orientation week, all new SBES graduate students will attend an SBES welcome/orientation session which will cover many important topics pertinent to getting started as a graduate student. During orientation week there will be mandatory departmental and university-wide meetings that must also be attended by all students.

VIRGINIA TECH ORIENTATION

New Student Orientation (Virginia Tech Campus)

New students enter into the SBES graduate program only in the fall semester which at VT begins in August (for assistantship purposes). Assistantships begin Aug. 10 to align with VT payroll schedules. The Graduate School considers the academic year to run from August 16th to May 15th. However, slight calendar differences from year to year can affect these dates so that the actual starting and ending dates with respect to classes, graduation, etc. can vary. Classes generally begin somewhere around the 4th week of August.

Upon arrival all international students new to Virginia Tech are required to check in with the Graduate School and with the [Cranwell Center](#). They must also attend a university orientation session for new international students. Additionally, a SBES orientation website has a list of onboarding requirements that students must follow as well as attend the SBES Orientation day at the home campus.

During this week any student appointed to a GTA position must attend a mandatory GTA workshop held by the graduate school for which the student earns 1 credit hour that does not count towards the BME plan of study. Other mandatory activities include laboratory safety seminars and building orientation. During orientation week, students will be meeting with the faculty supervisors under whom they'll be working as graduate assistants.

Orientation Requirements (Virginia Tech Campus)

Obtain a Hokie Passport Card:

You should obtain your student identification card (Hokie Passport) as soon as possible upon arriving. It is used constantly across the campus for numerous things, including getting a parking permit. It can be obtained at the Student Services Building (100 Washington St.) between 8:00am and 5:00 pm, Mon-Fri. This should be one of the first things a new student does upon arrival.

Create a PID:

As soon as you know your student identification number (your Banner ID), you should create your Virginia Tech PID (Personal Identifier). Go to <https://onboard.it.vt.edu/> and follow the instructions given. You will be creating the "username" part of your VT email address, and your PID is needed for logon access to many VT services and functions.

Purchase a Parking Permit:

Students are encouraged to obtain parking permits as soon as they arrive in Blacksburg. Parking permits can be purchased either online or at the parking transportation office at 605 Research Center Drive. Students should bring their Hokie Passport cards and their vehicle registrations.

Graduate assistants with a 100% assistantship will have the option to purchase the university parking permit with pre-tax dollars through payroll deduction. The department responsible for the assistantship appointment must enter the position into Banner before eligible students will be able to enroll in the program. Details will be available in the student's University Account section of their Hokie SPA.

Parking Permits are required to park on campus from 7:00 am—10:00 pm, Monday—Friday (unless signed otherwise). Parking regulations are always in effect, including when classes are not in session. Permits are not required on campus after 10:00 pm or on the weekends except where otherwise signed. The purchase of a permit does not guarantee a parking space, but merely allows for legal parking in specific areas of the campus. Parking rules and regulations can be found at <http://www.parking.vt.edu/forms.asp>. Be aware that parking is strictly enforced and the fines for illegal parking are quite steep!

International Students and Social Security:

New F-1 and J-1 visa international students should contact the Cranwell Center about applying for a Social Security card. The Cranwell Center will help students and employees make arrangements to go to the Roanoke office since they are no longer coming to the campus on a monthly basis. Information about Social Security can be found here: http://www.international.vt.edu/volunteers/social_security/index.html.

Complete Payroll Paperwork:

All newly funded graduate students (assistantships and fellowships) are required to fill out employment paperwork (I-9 and other Payroll Forms) which must be done prior to or on the first day the employee reports for work. This is normally done prior to or during the SBES departmental general orientation which takes place on the first day of VT's campus-wide orientation week. Failure to complete the necessary paperwork by the deadlines can result in a delay of the employment start date regardless of the effective start date on the contract. Students are NOT allowed to work until this paperwork has been completed. The academic year start date for assistantship employment each fall is generally August 16 (although the payroll date will differ and some contracts may be written on payroll dates. The difference will be explained at orientation). Students must present proof of their eligibility to work in the United States and proof of their identity. Information regarding the necessary documentation is dispensed to new graduate students in the summer prior to arrival.

Have Student Photo Made:

You will be asked to fill out a media permission slip as well as provide a photo that can be used for general announcements or congratulations within the department.

Find Your Mailbox:

All SBES students will have a mail box on the 3rd floor of Kelly Hall. Check your mailbox frequently as this is one of the primary vehicles through which you will receive university and departmental mail. It is NOT to be used as a personal mailbox for regular U.S. postal mail. Students are NOT to have personal packages delivered to the SBES offices or labs and SBES staff should not be asked to sign for any such parcels.

Additional Paperwork:

Part of your life as an SBES graduate student will be the completion and processing of many forms as you progress through the various stages to your degree. Some are departmental and many are from the graduate

school. The forms generally require various signatures of administrative personnel such as the Graduate Program Chair, Department Head, Dean of the College, and Dean of the Graduate School.

SBES students must work through the SBES Graduate Coordinator in getting these various forms submitted and processed. The SBES website contains departmental forms, but many that you will use are on the Graduate School's [website](#) or on the SBES Advising site in Canvas . Students are not to fill out the forms and gather signatures without the guidance of the SBES Graduate Coordinator. In particular, students are not to ask the Graduate Program Chair or the Department Head (SBES Director) to sign forms. The SBES Graduate Coordinator needs to process and make copies of all forms before anything goes out to other offices. This routine also applies to internal (within SBES) procedures which require forms and/or letters with administrative signatures.

Students are advised to pay attention to timelines around the submission of various graduate forms. Usually the websites (The SBES Advising site in Canvas and the Graduate School's website) announce necessary deadlines and time constraints or they are printed on the forms themselves. The deadlines are particularly important when it comes to following the graduate school's requirements. Delays in the submission of certain forms can directly affect the student's scheduling with respect to graduation.

Additional forms may need to be completed prior or at orientation. Your graduate coordinator will let you know what is needed.

Hokie SPA:

Hokie SPA (Student Personal Access) is a web application that allows VT students to check grades, schedules, bills, or financial aid information from a web browser. To log in, a Personal ID (PID) is required. New students will receive information on PID creation at the time of admission. The acceptance letter from the Dean of the Graduate School contains the information needed. A Banner ID number is assigned to each student by the graduate school, and an explanation of the PID is given along with the website address where the PID can be created by the student.

Hokie SPA is designed to provide student access to student data, the Drop/Add process, etc. from home or residence hall; it is not set up for advisor or departmental access to student records. The web address is <http://hokiespa.vt.edu/> . It is the student's responsibility to keep the information on Hokie SPA current with respect to current mailing address, email address, phone number, and other contact information that the university uses. It is also the student's responsibility to keep track of university checklists/process shown on their student records.

Trainings, Vaccinations, Background Checks:

A list of required trainings is posted on the SBES Orientation website. Students must complete all trainings listed and send proof of completion to the SBES Graduate Coordinator prior to arrival on campus. In addition, the university requires proof of vaccination records. These go to the university and not the SBES Graduate Coordinator. If you are a new PhD student, you will be asked to submit additional requirements to participate in Clinical Rotations in the spring. These requirements will include a background check, certain vaccines/tests, forms, and possible more.

Student Account Information (Virginia Tech Campus)

Electronic Billing:

Virginia Tech does all billing electronically. No paper statements are sent out to students. Bills are generated for new charges shortly before or on the 15th of the month, and payment is due by the 10th of the following month. E-mails are sent to the VT email address on file for students notifying them and their authorized payers that a bill has been generated and is available for viewing. Students use Hokie SPA to access their accounts. For more detailed information about billing and making payments, see the Bursar's website at http://www.bursar.vt.edu/billing_payment/.

Payroll:

All Virginia Tech employees are required to have their pay directly deposited to a bank. All banks must be members of the Automated Clearing House. During orientation week you can apply online for Direct Deposit through HokieSpa. Follow the directions given and you will be sent an email from the Bursar telling you when it will take effect. Subsequent paychecks will then be deposited directly into your account.

There are two pay periods per month which run from the 10th to the 24th of each month, and from the 25th to the 9th of the next month. This is how your assistantship appointments are entered into the Banner system. There are 24 pay periods in the calendar year distributed as follows during the semesters:

- Spring semester (Dec. 25-May 9) = 9 pay checks
- Summer I (May 10-June 24) = 3 pay checks
- Summer II (May 25-Aug. 9) = 3 pay checks
- Fall semester (Aug. 10-Dec. 24) = 9 pay checks

Pay days are on the first (1st) and the 16th of the month, with some slight occasional variations due to holidays, weekends, etc.

Late Fees and Holds on Accounts:

Late fees will be added to student accounts if payments due are not made by the posted due date. If tuition charges are not paid on time, students can be dropped from class rolls so that they will have to register later, and a late fee is added to the amount due. It is strongly recommended that students refer to the payment deadlines for each semester's tuition and fees posted on the Bursar's website. Even if a graduate student's tuition is being paid by the department through an assistantship, the payment deadline still applies to the comprehensive fees and the student is responsible for adhering to it. Students may opt to use payroll deduction to spread out the payments of student fees that are due or pay remaining student fees in a one-time payment. This can be done in HokieSpa. Under certain circumstances late fee charges can be appealed through a process described on the Bursar's website.

If a student is dropped from classes for non-payment and then wishes to be reinstated, they will be charged a late fee of 10% of the past due balance not to exceed \$125.00 per term and also a \$75 reinstatement fee. These are two separate fees. A 'hold' is placed on a student account if there is a past due balance. Students are not able to carry out normal online transactions with holds on their accounts. They cannot view their schedules, access drop/add, access course request, or receive a transcript until the 'hold' is lifted by payment of the past due amount. This routine applies to ANY university monetary charges, not just tuition. Holds can be placed for unpaid parking tickets, library fines, insurance issues, etc.

Budget Tuition Plan and Payment of Comprehensive Fees:

Virginia Tech offers students (or parents) the opportunity to spread out the cost of tuition, dining, and fees into monthly installments which are directly debited to the students' bank accounts. Participation in the plan

requires filling out an application. Inquiries about the plan should be directed to the Office of the University Bursar. Graduate students may utilize payroll deduction to pay comprehensive fees each semester. This ONLY applies to graduate students on assistantships (no fellowships, etc.) and application through Hokie SPA can only be made after the assistantship appointment has been entered into the Banner system. This process must be renewed each semester.

Stipend Year:

At Virginia Tech, the stipend year will include the fall, spring, summer I and summer II semesters. Stipends are typically entered/renewed 3 times a year (Fall, Spring, Summer) though some students may receive their assistantships from Aug.-Aug. if the funding comes from another source. This policy is subject to review and modification by the SBES Graduate Program Committee at any time!

Student Services (Virginia Tech Campus)

Student Health Care:

All full-time graduate students are required to pay a health-service fee (part of the 'comprehensive' fees). The Health Services Office provides limited medical care at McComas Hall for students when school is in session and between semesters for those students required to work. The health fee does not cover family members, and students who are not registered for classes are not eligible for services. International students are required to have insurance on themselves and all family members. The insurance policy can be obtained through the university or through private U.S. and international insurance companies. International students should consult someone at the Cranwell Center if questions arise.

Student Medical Insurance:

Virginia Tech graduate students who are given assistantships are also offered an enhanced insurance benefit. More detailed information regarding the insurance plan and its benefits can be found on the [Graduate School website](#). Currently, the VT Graduate School covers 88% of the medical insurance premium through assistantships. Students are not required to use the VT insurance and may opt to use their own instead.

Leave of Absence (Virginia Tech Policy):

Leaves of absence for personal, family, or health reasons may be taken as long as the graduate student follows Graduate School guidelines. Graduate students are expected to discuss with their advisor and Graduate Coordinator prior to taking a leave of absence, the timing and duration of the leave, along with responsibilities associated with their appointment (if supported on a GRA, GTA, or GA).

Graduate students should inform their faculty advisor of any leaves of absence that may be needed as well as the expected departure date and date of return to their program of study. Graduate students should know that readmission is not guaranteed after extended leaves of absence (over one year).

Graduate students should understand that re-appointment on assistantship after a leave of absence is contingent upon the length of leave, resources available to cover the responsibilities left unmet by the leave of absence, and the contractual agreement with granting agency for a GRA. Where possible, arrangements should be made before leave is taken.

The Graduate School also has a work-life grant for students who need to take a temporary leave due to things like a birth/adoption of a child, major illness, or family death. Please refer to the Graduate School website and the graduate coordinator if you wish to request this.

Ombudsman & Dean of Students:

The graduate student ombudsperson helps graduate students resolve issues and address concerns that arise within the university setting. Acting as an advocate for fairness, the ombudsperson provides information about institutional policies and works to help graduate students manage conflicts, understand the university system, and learn more productive ways of communicating.

The office provides a safe place for graduate students to be heard and to receive impartial attention without fear of loss of privacy. Consultations are kept confidential, unless the students grant the ombudsperson permission to discuss issues with involved parties or administrators. For more information:

<http://www.graduate.ombudsman.vt.edu/>

Students may also wish to contact the Dean of Students (or the Graduate School) should issues arrive such as crisis/emergency response, general support/advice, counsel and referral, student conduct advising, and extended absence, etc. More information can be found here: <https://dos.vt.edu/>

Cook Counseling:

Mental health can be challenging as a graduate student. In addition to the McComas Health Clinic, VT also offers mental health services through the Cook Counseling Center also located in McComas Hall. More information can be found here: https://ucc.vt.edu/about/appointments/information_students.html

Services for Students with Disabilities:

SSD Provides accommodations to students on a case-by-case basis depending on the type of disability they may have. Students should [set up an appointment](#) to meet with SSD should they need accommodations. Additionally, students are encouraged to speak with SBES Faculty and/or Staff as early as possible when accommodations are expected so that the program can work with you on those accommodations.

Cultural and Community Centers:

Cultural and Community Centers at Virginia Tech support underrepresented and underserved students through education, advocacy, advising and leadership development. They strive to promote a welcoming campus in which students feel a sense of belonging and can find support in expressing pride in their social identities. They aspire to foster a more accessible and culturally affirming campus environment through community building, collaborative programming and social justice education. For more information please visit their [website](#).

WAKE FOREST UNIVERSITY ORIENTATION

New Student Orientation (Wake Forest Campus)

Orientation for new SBES graduate students at WFU occurs in August before classes begin and is mandatory for all students. If a student has a situation which will not allow attendance at all phases, the student MUST contact the Biomedical Science Program Director, Dr. Erik Brady at ebrady@wakehealth.edu, or his assistant Denise Wolfe at 336-716-4303, or dewolfe@wakehealth.edu to discuss the particulars of the situation. Email communication will be sent out approx. 4 weeks prior to orientation with instructions on the various onboarding processes which should be completed prior to the Graduate School's orientation. The email communications will include information on registration, student health insurance, date/time of orientation, wakehealth email accounts, student ID's, etc. Please do NOT contact the program (SBES) director.

Email communication will be sent out approx. 4 weeks prior to orientation with instructions on the various onboarding processes which should be completed prior to the Graduate School's orientation. The email communications will include information on registration, student health insurance, date/time of orientation, wakehealth email accounts, student ID's, etc.

Orientation Requirements (Wake Forest Campus):

Obtain a WFU ID card:

Arrangement is made with security during orientation for each student to obtain a photo identification card. Students must wear their ID badges at all times while on campus.

Parking Permits:

Bowman Gray campus students may sign up for monthly parking at orientation. Those who take classes on the Reynolda campus, including audit, or use other facilities, may register their vehicles to park in an off-campus lot and must pay any associated fees. To park on campus, a commuter student decal must be purchased. Students are responsible for their visitors. Students will be held financially responsible for citations issued to vehicles driven by family members or by friends who use a WFU/Bowman Gray student's vehicle.

International Students and Social Security:

Newly arrived international students should notify the Graduate School (bggrad@wakehealth.edu) as soon as possible after arriving in the United States. Permission to request a Social Security card will be given to students who will earn a stipend by the International Students and Scholars Office. Detailed information on obtaining a Social Security card can be found on the WFU Center for International Studies website: <https://global.wfu.edu/iss/ssn/>.

Complete Payroll Paperwork:

During the afternoon of the first day of orientation you will meet with Human Resources where you will complete the necessary paperwork for being placed on the payroll. You will be required to present documentation confirming your identity, and a form containing a list of acceptable identification documents is available on the orientation website: <http://graduate.wfu.edu/Orientation/index.html>.

Creating a Virginia Tech PID (Personal Identifier):

In order for WFU SBES students to have access to certain Virginia Tech online services – library access being the primary one – a VT PID must be created. The PID is your unique identifier and it is also the front part of your VT email address. The SBES acceptance letter from the deans of both graduate schools contains instructions for creating the PID. You are assigned a VT Banner (the campus computer system) ID number which you will use to create your PID. Please note: The Banner number (90XXXXXX) is NOT the PID. Instructions and information on how to do this can be found at <https://onboard.it.vt.edu/>.

Have Your Student Photo Made:

You will be given instructions during orientation regarding having your photo made for the SBES poster and the WFU yearbook. Once you have an electronic version of your photo, you must send it to the SBES Graduate Coordinator so that it can be added to your file.

Paperwork:

Part of your life as an SBES graduate student will be the completion and processing of many forms as you progress through the various stages to your degree. Some are departmental and many are from the graduate school. The forms generally require various signatures of administrative personnel such as the Graduate Program Chair, Department Head, Dean of the College, and Dean of the Graduate School.

SBES students must work through the SBES Graduate Coordinator in getting these various forms submitted and processed. The SBES Advising site in Canvas contains departmental forms, but many that you will use are on the WF Graduate School's website. Students are not to fill out the forms and gather signatures without the guidance of the SBES Graduate Coordinator. In particular, students are not to ask the Graduate Program Chair or the Department Head (SBES Director) to sign forms. The SBES Graduate Coordinator needs to process and make copies of all forms before anything goes out to other offices. This routine also applies to internal (within SBES) procedures which require forms and/or letters with administrative signatures.

Students are advised to pay attention to timelines around the submission of various graduate forms. Usually the websites (SBES Advising Canvas Site and the WF Graduate School's) announce necessary deadlines and time constraints or they are printed on the forms themselves. The deadlines are particularly important when it comes to following the graduate school's requirements. Delays in the submission of certain forms can directly affect the student's scheduling with respect to graduation.

Additional forms may need to be completed prior or at orientation. Your graduate coordinator and other staff at Wake Forest will let you know what is needed.

Student Account Information (Wake Forest campus)

Stipend Year:

At Wake Forest, the stipend year runs from mid-August to mid-August; the exact dates will be announced at the beginning of the fall semester. This policy is subject to review and modification by the SBES Graduate Program Committee at any time!

Approval for Reimbursements:

SBES students requesting reimbursement for expenses from Biomedical Engineering must follow the procedures below PRIOR to registering for a professional meeting or purchasing items:

Travel Reimbursement Process:

Travel will ordinarily be reimbursed from research accounts at the approval of your advisor. If your travel is approved by your advisor, you must then complete an Authorization for Absence form and receive approval from your advisor and the Graduate Program Director.

A Travel Authorization must be completed and forwarded to the Department Chairman for approval. All expenses associated with the meeting should be listed in detail (i.e., registration costs, lodging, airfare, meals, etc.) In addition, the account number that should be charged must also be listed.

Upon return from the meeting you must submit original receipts for the items approved for reimbursement. This includes original itemized meal receipts; credit card receipts are not sufficient. If you do not have receipts, reimbursement will not be granted. An Expense Voucher and original receipts should be given to the administrative assistant for processing. Do not submit expense reimbursements directly to the BME Accounting clerks. Failure to follow these procedures may result in out of pocket expenses. Forward all forms to the BME Administrative Assistant.

In some cases, funds may be available from the department to support student travel. A detailed budget must be submitted to the Graduate Program Director and approved prior to registering for a meeting or submitting a paper. All expenses associated with the meeting should be listed in detail (i.e., registration costs, lodging, airfare, meals, etc.). The student should also request funds from the Graduate School. The Department will review your budget request for reimbursement and approve or deny your request. You will be notified in writing of the outcome.

Purchase Reimbursement Approval Process:

Provide a purchase request form to the BME Administrative Assistant and include a quote of the items to be purchased, their use, where they will be stored, and the research account to be charged (pending advisor approval). This form can be obtained from the BME Administrative Assistant. If approval is granted, you will be notified in writing.

After purchasing the items, the original receipt should be given to the Administrative Assistant for processing. Do not submit receipts for reimbursement to the BME Accounting clerks. Failure to follow these procedures may result in out of pocket expenses.

Student Services (Wake Forest Campus)

Student Health Care:

Students may be seen in Wake Forest Baptist Health – Family Physician outpatient clinic located on the 3rd floor of the Piedmont Plaza 1 at 1920 West First Street. Clinics hours are Monday through Friday, by appointment, for preventive and therapeutic services. Physicians are available for emergencies twenty- four hours a day, seven days a week, through an answering service.

PhD students who enroll in the University's student health plan will receive a supplement that pays approx.. half the monthly premium. All students will enroll or waive out of the plan each semester during open enrollment periods. Students who do not enroll or waive out of the plan will be automatically enrolled in the university policy and charged the full cost of the premiums for the semester. Enrollment and waiver procedures are done online.

Students are required to have adequate health insurance. The student's medical insurance company will be billed for all visits to clinics and/or physicians. Any medical charges generated that are not covered by the student's insurance policy will be the personal responsibility of the student. Students may enroll in the student health and accident insurance plan which is offered through the Graduate School from United Healthcare. Links to the company's insurance information and forms for enrolling are made available on the WFU Graduate School's Orientation website.

Leave of Absence:

Full-time students who wish to take a leave of absence must receive approval from the department concerned and the dean of the Graduate School. The student must submit a leave of absence request in writing, be in good academic standing, complete forms required by the Graduate School for courses in progress, and provide letters of support from the program director and advisor. The maximum time for a leave of absence is one academic year.

One month prior to the beginning of the semester in which the student plans to re-enter the Graduate School, a written reinstatement request must be sent to the dean of the Graduate School. The time spent during the

leave of absence will not count in the maximum time allotted for the degree. If a student on an approved leave has not requested reinstatement after a year, the student will be considered to have withdrawn from Graduate School.

GENERAL PROGRAM AND DEGREE INFORMATION FOR ALL SBES STUDENTS

Types of Degrees

The joint Biomedical Engineering program between Virginia Tech and Wake Forest University (SBES) offers the following degrees:

Program	Degree	Location
BME	MS	Either campus
BME	PhD	Either campus
BME	MD / PhD and MBA / PhD	WFU only
BME	DVM / PhD	VT only
BME	Accelerated UG/G	VT only

Students select a campus location during the application and admissions process. The choice is based on the student's anticipated area of concentration and/or a choice of faculty or research interests.

The combination degree programs are specific to a particular campus and are intricately tied to admission into the respective medical schools associated with SBES. Combination MD/PhD degree applicants must apply and be accepted into the Wake Forest University School of Medicine before being considered for the PhD degree in Engineering. Similarly, DVM/PhD degree applications must be accepted by the VT/MD DVM program before being considered for the PhD degree in Engineering.

The Accelerated Undergraduate/Graduate (UG/G) Degree program is also a specialty 'degree-path' in which qualified honors-level undergraduates from various engineering departments at Virginia Tech can begin working on a SBES M.S. or Ph.D. degree during the senior year as they complete their B.S. degree.

Advisor and Advisory Committee

As early as possible, but no later than the end of the second semester of study, the student must select an SBES faculty member (primary or affiliate) who will serve as the student's advisor, supervise the student's research, and chair or co-chair the advisory committee. The advisor will report on the student's progress to the degree and will issue the grades for research and dissertation since each student is asked to register for research hours under the advisor's section in the Timetable. The Graduate Program Chair may serve as a temporary interim advisor until a permanent advisor is found.

The advisor must be a primary or affiliate SBES faculty member. At Virginia Tech the SBES Graduate Program Chair often serves as a 'temporary' advisor until the student forms a relationship with a chosen faculty member. During the time of the interim advisor, the student should register for research hours under the temporary advisor's name. Once an advisor is chosen, the student will sign up for research hours under the chosen advisor's name.

The function of the advisory committee is to approve the plan of study, provide advice, periodically assess the student's progress toward the degree, and conduct the final examination.

All persons serving on a Master's and/or Doctoral committee are required to hold a terminal degree (i.e. M.D., Ph.D., DVM., etc.)

The M.S. degree advisory committee is composed of a minimum of three (3) people:

- The advisor (and co-chair if applicable) and two other faculty members.
- At least 1 of the 3 must be a SBES (primary or affiliate) faculty members, including the chair.
- At least 1 of the 3 must be an engineer.
- Students may have up to 4 persons on the MS committee if so desired.

The SBES Ph.D. degree advisory committee is composed of a minimum of five (5) people:

- The advisor and at least 4 other faculty members
- At least 2 of the 5 must be SBES (primary or affiliate) faculty members, including the Chair.
- At least 3 of the 5 must be engineers.
- Students may have up to 6 persons on the PhD committee if so desired.

For purposes of SBES advisory committee composition an 'engineer' is defined as:

- A primary or affiliate SBES faculty member from either campus that also has a degree in engineering or has a primary appointment in an engineering department or a faculty member associated with WFIRM.
- A non-SBES faculty member with a primary appointment in an engineering department.
- Anyone with a degree in engineering.

SBES advisory committee primary/affiliate definition is defined as:

Primary SBES Faculty Requirements:

- Faculty that have a primary appointment (or tenure) in the Biomedical Engineering Departments at either campus.
- And, whose primary research interests and funding are in the Biomedical Engineering Departments at either campus.
- And, who participate in teaching SBES courses.
- And, who participate in SBES activities, including committee appointments and faculty meetings.
- And, who fund and mentor SBES students and Post Docs in the Biomedical Engineering Departments at either campus.

Affiliate SBES Faculty Requirements:

- Faculty that are affiliated with the SBES program but have a primary appointment (or tenure) with another department other than the Biomedical Engineering Departments at either campus.
- And, who have primary research interests and funding in biomedical engineering and/or mechanics in another department.
- And, who participate in teaching SBES courses or biomedical engineering courses in another department.
- And, who participate in SBES activities, including committee appointments and faculty meetings.
- And, who mentor SBES students and Post Docs if possible in addition to home department students.

Outside Committee Members:

Personnel from outside the established graduate faculties of both campuses may serve on advisory committees if approved by both Graduate Schools and the SBES program. *Personnel from outside the established graduate faculties of both campuses may serve on advisory committees if approved by the VT and WFU Graduate Directors as well as the students respective Graduate School. In order to obtain these approvals please reach out to the Graduate Coordinator. These personnel may make up no more than one-third of the minimum committee membership for a master's committee of three. In that case, two must be VT/WF/SBES, and one may be external (outside of VT/WF). For a doctoral committee, up to two of the five committee members may be external (outside of VT/WF), at least three must be VT/WF/SBES. Similarly, for a PhD committee of six members (the maximum amount) two of the six committee members may be external. The committee is established at the time of filing the Plan of Study. Students are always encouraged to involve SBES faculty from the opposite campus on their committees if possible.*

Faculty located at VCOM in Blacksburg are not considered Virginia Tech faculty and therefore must be considered as outside committee members.

Faculty located at the Virginia-Maryland Veterinary School in Blacksburg can be used as internal members as long as they also have primary or affiliate faculty appointments with SBES. Those that do not, should also be considered outside committee members. Faculty at the Virginia-Maryland Veterinary School may request to become affiliate faculty through the BEAM department.

For the purposes of SBES advisory committee composition, an 'outside member' is defined as: Anyone outside of SBES and/or anyone outside of the Virginia Tech or Wake Forest University Campus (i.e. faculty from other universities or industry partners).

Please see the graduate coordinator if you have outside committee members so that they can be approved by the graduate school and the SBES program prior to your final plan of study submission. Outside members will need to provide to the SBES Graduate Coordinator a full CV as well as contact information (full name, email address, VT ID# if they have one, etc.) The SBES Graduate Coordinator will work with the SBES Graduate Directors and the VT Graduate School for obtaining necessary approvals. Students at the WF campus should also check with the WF Graduate School for any additional procedures ONLY AFTER the program has approved the outside committee member.

Committee Member Conflict of Interest:

When choosing committee members, SBES adopts the VT Graduate School policy on committee member conflict of interest. This applies to all campus locations.

https://secure.graduateschool.vt.edu/graduate_catalog/policies.htm?policy=002d14432c654287012c6542e38200d8

In selecting members of your advisory committees, students and their Committee Chair should take pains to avoid situations that might create conflicts of interest for the student or be impacted by coercive relationships among the committee members or between the student and committee members. It is of paramount importance that all committee members be free to evaluate the student's work based on its academic merit alone.

DEGREE PROGRAM REQUIREMENTS

DOCTOR OF PHILOSOPHY DEGREE (Both campuses)

Degree Requirements

Students pursuing a BME Ph.D. must take a minimum of 90 course credit hours beyond the B.S. degree. An M.S. degree is not required for admission to the Ph.D. program. The 90 hours may be distributed as follows:

For those who joined the program BEFORE Fall 2023:

- 35 – 50 credit hours of coursework (5000-level & above at VT)
- 40 – 55 credits of research & dissertation (BMES 7994 at VT)

For those who joined the program Fall 2023 and later:

- 29-44 credit hours of coursework (5000-level & above at VT)
- 46 – 61 credit hours of research & dissertation (BMES 7994 at VT)

All Ph.D. students write and defend a dissertation. Most students spend an average of 4-5 years completing the Ph.D., although degree completion can take longer depending on the nature of their research project. In some cases, students entering the program with an M.S. may complete the degree in a shorter amount of time. The degree requirements pertaining to specific courses are shown in the table below: Credits shown represent the minimum required to obtain the degree. Seminar enrollment is required each semester, but the credits are not counted toward the degree.

Elective requirements for the program are courses that are considered “technical electives” in ENGINEERING, LIFE SCIENCE, or MATH. Students should refer to the section that details what an “Elective” is and the list of SBES approved Life Science and Math courses that may be considered as an elective. Courses that begin with GRAD are not considered technical elective courses for the program. A student who feels that a course not listed should be considered, they should send the course information and syllabus to the graduate directors and coordinator for prior approval.

Table 1: Degree Requirements for the Ph.D. Degree in Biomedical Engineering

For those who joined the program BEFORE Fall 2023:

Course Category	Course # (VT/WF)	Title	No. Credits Req.
Biomedical Engineering (15 credits)	BMES 5054 / 605	Quantitative Cell Physiology (required)	3
	BMES 5064 / 606	Quantitative Organ Systems Physiology (required)	3
	5000 or 6000 level (600/700 at	Min. 9 credit hours of engineering courses approved by committee	9
Life Sciences (3 credits)	5000 – 6000 level (600/700 at WFU)	Min. 3 credit hours approved by committee – <i>(see approved list)</i>	3
Math Requirement (6 credits)	5000 – 6000 level (600/700 at WFU)	Min. 6 hours from approved list <i>(see approved list) (only 3 credits can be statistics)</i>	6
Electives (9 – 24 credits)	5000 – 6000 level (600-700 WFU)	Graduate courses in Engineering, Math, or Life Science approved by committee	9 – 24
Clinical Rotation	BMES 6064 / 706	Required of all Ph.D. students	2

Graduate School Requirements (0 credits)	Required by the Graduate Schools	VT: BMES 5004 and ENGE 5304 WF: GRAD 713, GRAD 714, GRAD 715, and GRAD 716	Does not count toward 90 hours but required by Graduate Schools
BME Seminar	BMES 5944/694	Min. 6 credits (6 semesters) required, additional attendance encouraged!	Does not count towards 90 hours but required by Program
		TOTAL COURSE CREDITS:	35 – 50
Dissertation Research	BMES 7994/797	Research & Dissertation	40 - 55
		MINIMUM TOTAL CREDITS:	90

PHD Requirements for those who joined the program Fall 2023 and later:

Subject	Course # (VT # / WFU #)	Title	No. Credits Required
Biomedical Engineering (12 credits)	BMES 5054 / 605 OR BMES 5064 / 606	Quantitative Cell Physiology OR Quantitative Organ Systems Physiology (required)	3
	5000 or 6000 level (600 / 700 at WFU)	Min. 9 credit hours of engineering courses approved by committee	9
Life Sciences (3 credits)		Min. 3 credit hours approved by committee – (<i>see approved list</i>)	3
Mathematics (3 credits)	5000 – 6000 level (600 / 700 WFU)	Min. 3 credit hours (<i>see approved list</i>)	3
Electives (9 - 24 credits)	5000 – 6000 level (600 / 700 at WFU)	Graduate courses in Engineering, Math, or Life Science approved by committee	9 - 24
Clinical Rotation	BMES 6064 / 706	Required of all Ph.D. students	2
Graduate School Requirements (0 credits)	Required by the Graduate Schools	VT: BMES 5004 and ENGE 5304 WF: GRAD 713, GRAD 714, GRAD 715, and GRAD 716	Does not count toward 90 hours but required by Graduate Schools
BME Seminar	BMES 5944/694	Min. 6 credits (6 semesters) required, additional attendance encouraged!	Does not count toward 90 hours but required by Program
		Total Course Requirements:	29 - 44
Dissertation Research (40 – 55 credits)	BMES 7994	Research & Dissertation	46 - 61
		Total Minimum Number of Credit Hours	90

NOTE: Course numbers cited above list Virginia Tech campus first (4-digit system), followed by 3-digit numbers at the Wake Forest campus. Course numbers for both campuses on all classes offered can be found on the SBES website.

Plan of Study

A draft “Plan of Study” should be created and filed as soon as the student selects an advisory committee and no later than the end of the third (3rd) semester of study. The plan of study must be approved by the advisory

committee and by the SBES Graduate Program chair prior to submission to the Graduate School. The plan of study outlines the specific courses to be taken in fulfillment of the degree requirements as outlined in the chart above. See “Progress to the Degree”, for a fuller discussion of the plan of study and how to prepare it. A course may only be used once in the plan of study towards the satisfaction of a single requirement. Students wishing to do their MS and PhD degrees in the program may double count their courses for both plans of study but may not triple count. Note that in addition to the course requirements, the program requires a clinical rotation for all Ph.D. students, ethics requirements and at VT, the graduate school has a diversity/inclusion requirement that must also be met.

Clinical Rotation

The Clinical Rotation is a required 2 credit class for SBES Ph.D. students. Its purpose is to provide engineering students with real experience in a medical environment in order to better understand how their biomedical research projects relate to clinical practice. The rotation consists of approximately 3-4 weeks during which the students take part in Gross Anatomy, Patient Simulation and clinical situations under the mentorship of faculty and other medical personnel. Rotations are held at Wake Forest University Baptist Medical Center in Winston Salem, and at various locations at the Roanoke and Blacksburg campuses.

Students are expected to complete the rotation in the sequence in which it is given, and attendance at all sessions is mandatory. Students will participate in the Gross Anatomy Lab, Patient Simulation Lab, and receive exposure to many clinical experiences including surgical cases, rounds, clinics and labs. Gross Anatomy and Patient Simulation are to be completed at the Medical School in that order with surgical and medicine rotations to follow.

Orientation at Wake Forest University Health Sciences is required and must be completed prior to the start of the rotation. Students will be required to submit immunization records, complete a confidentiality agreement, adhere to Medical Center policies and procedures, and are held to the same HIPPA policies as Medical Center employees. Notification of the clinical rotation dates are given prior to the end of the fall semester. Gross Anatomy and Patient Simulation may include sessions during winter and spring breaks. Surgical and medicine rotations are typically held following the end of the spring semester – late May to early June.

Students who enter in the spring semester as a deferred PhD student or as a MS to PhD student must wait until the following spring semester to take the Clinical Rotation course.

Qualifying Examination

A Qualifying Examination is required for all Ph.D. candidates and serves to evaluate the student’s mastery of fundamental knowledge and to diagnose deficiencies. The examination must be taken by the end of the first year for students entering directly into the Ph.D. program or within one (1) year of entering the program after completing the M.S. degree (for terminal M.S. students). Students may not take the exam until they are officially PhD students in the program. Students enrolled in the Ph.D. program earning an M.S. along the way are expected to meet the aforementioned deadlines and take the exam on the Ph.D. schedule; they may NOT delay until completion of the M.S. degree. Requests to delay the exam must be made to the Graduate Program Directors with support of the student’s Advisor, and must show exceptional academic need. If the delay request is approved, the student must take the Qualifying Exam the next time the Qualifying Exam is offered by SBES.

The examination is offered once a year over a three-week period, normally in July. During this time period, students should expect to work only on the exam and not travel during the exam period.

Scheduling conflicts are not acceptable reasons to defer the exam. The current exam format is based upon a student's defense of an original research proposal addressing a problem designed by the Graduate Program Committee or its representative. Students are given the problem (via Canvas), after which they have approximately 2 weeks to prepare a written proposal to be presented and defended orally to a 3-person qualifier exam committee at the end of the third week.

The student is expected to demonstrate proficiency in engineering, life sciences, and quantitative analysis, as well as show advanced understanding of the fundamentals which pertain to the problem's solution. Instructions and information regarding the nature of the exam are made available to students through Canvas and/or Qualifier Exam Prep sessions delivered by faculty.

There are three possible results for the exam: Pass, Conditional Pass, and Fail. Students are evaluated on their ability to formulate a rational approach to solving the assigned problem as well as on their grasp of fundamental principles.

A fail indicates that a student has significant weakness in the work or underlying fundamentals. A fail is also given if a student fails to meet the deadline for the written proposal, fails to meet the deadline for presentation of the oral defense of the proposal, or withdraws from the exam any time after the problem has been distributed.

A 'conditional pass' is given when the examining committee feels that the student has some weaknesses in the work which need to be remedied, but which are not serious enough to warrant a 'fail' evaluation. In such a case the committee chair submits a written statement to the student and to the SBES Graduate Coordinator outlining the nature of the weakness(es) and specifying what the student needs to do in order to earn a 'pass'. This description also includes a time requirement for completion of the remediation.

The Qualifier Examination is a departmental, 'internal' exam and therefore is not scheduled through the graduate school.

Students who pass the Qualifying Exam may continue with the program and begin to work towards the Preliminary Examination. A student may earn a Conditional Pass result on the exam instead of a Pass or Fail result. Each student who receives a Conditional Pass will be provided with a remediation plan to address the steps needed to fulfill a Pass result. Students will be given a minimum period of two (2) weeks but no longer than two full semesters. The time period is designated by the Qualifying Examination Committee to fulfill the Qualifying Examination Committee requirements of the remediation plan. Failure to meet the requirements by this deadline will result in a Fail result of the Qualifying Examination.

Each student is permitted a total of two (2) attempts to pass the Qualifying Examination. A student who fails the Qualifying Exam in the first attempt must retake the Qualifying Exam during the next opportunity that is offered by SBES. A student who fails the Qualifying Examination on their second attempt will be dismissed from the PhD program and given the option to pursue a MS degree (if available).

All Ph.D. candidates are required to pass a Qualifying Examination in order to become formal candidates for the Ph.D. degree. The examination serves to evaluate the student's mastery of fundamental knowledge and to diagnose deficiencies. See Section 2 for the required timing of the exam. Students who do not pass the qualifier on the first attempt are given one more opportunity to take the exam. The second attempt must be made the following year. Requests to delay the exam must be made to the Graduate Program directors with support of the student's advisor, and must show exceptional academic need. Failure to pass after two

attempts or by the third year of the PhD program will result in an automatic removal from the Ph.D. program; however, the option to complete an M.S. degree is available.

Note: Students must be officially enrolled in the SBES Ph.D. program in order to take the Qualifying Examinations. Students entering the PhD program out of cycle may opt to wait until after their first full academic year as a PhD student to take the exam.

Preliminary Examination

All Ph.D. students must take an oral Preliminary Examination administered by the student's Advisory Committee. The final plan of study must be submitted and approved prior to scheduling the written and oral preliminary examination and should have the participation of all committee members from the approved final plan of study. The preliminary examination is normally given near the end of the student's second or third year of graduate study and must be passed before the student can schedule their final PhD defense. In addition, the examination must be taken no later than 9-12 months prior to the completion of the final exam. At least 24 hours of course work and/or research must remain to be taken, including work for which the student is currently enrolled.

The purpose of the Preliminary Examination is to determine the student's ability to formulate a plan to conduct original research on a problem and produce a Ph.D. dissertation. It shall consist of an oral presentation of the research proposal, and shall provide the advisory committee with an identification of the problem to be solved, a pertinent literature review, the proposed research plan to include the feasibility and originality of the proposed work, and any preliminary data gathered. A written copy of the research proposal must be provided to each member of the committee at least two weeks prior to the examination. Specific questions may be asked by the committee members, not only on the research proposal content, but also on any academic background or course work related to solving the problem.

The student will present their dissertation research proposal to the advisory committee. The exam will cover all course material and the proposed research plan including the student's knowledge of the literature as well as the feasibility and originality of the proposed work. A written copy of the research proposal must be provided to each of the advisory committee members at least two (2) weeks PRIOR to the examination. The student's advisory committee must approve the research topic and plan in order for the student to continue working on their dissertation. Please note that your final Plan of Study must be submitted to the advisory committee at least 1 semester PRIOR to scheduling your preliminary examination.

During the exam, the examining committee passes or fails the student and notifies the VT Graduate School and the SBES graduate coordinator of the results.

At Virginia Tech, to pass any of the required examinations, a graduate student is allowed, at most, one "unsatisfactory" vote. Two or more unsatisfactory votes is considered a fail (not the committee majority). At Wake Forest, to pass any of the required examinations, a graduate student must have all committee members agree to either a pass or a fail.

If a student fails an examination, one full semester (a minimum of 15 weeks) must elapse before the second examination is scheduled. No more than two opportunities to pass any one examination are allowed. A student failing any of the examinations required by Graduate Policies two times will be dismissed from graduate studies by the Graduate School.

In the case of any failure, the committee may recommend that the candidate be dropped from the program, change to a MS degree seeking student, or re-take the preliminary examination (only once).

If a student decides to downgrade to a MS degree, they may not use their preliminary examination or the final PhD defense to count as the MS exam. A new MS exam will have to be scheduled a minimum of 15 weeks from the date of the original examination.

https://secure.graduateschool.vt.edu/graduate_catalog/policies.htm?policy=002d14432c654287012c6542e3630018

At Wake Forest this step is referred to as “advancing to candidacy” and it involves completing an application form after taking the preliminary exam, and submitting it to the WFU Graduate School for approval. The Preliminary Exam itself is not scheduled by the WFU Graduate School as it is at Virginia Tech. It is scheduled by the student’s committee.

Format:

Students should check with your entire committee to determine the format that the committee requires. SBES does not have a template or required format. It is up to the student and their advisory committee to determine the proper format for their particular area of research.

Timing and Retesting (Both Campuses):

Students are eligible to take the Preliminary Exam only after passing the Qualifying Exam. The examination should be taken at or near the completion of the coursework, which tends to be in year 3 or 4. The Preliminary Examination must be taken and passed at least nine (9) months prior to the completion of the Final Examination. Each student is allowed a total of two (2) attempts to pass the Preliminary Examination. A student is considered to have passed the examination if they receive no more than one negative vote on the examination. A student planning to retake the Preliminary Exam is expected to work with their Advisory Committee to (1) justify a second attempt at the exam and (2) develop a remediation plan that addresses the steps needed to prepare for a second attempt. A student is permitted to retake the Preliminary Exam no sooner than one (1) semester (15 weeks) and no later than twelve (12) months after the first attempt. A student who fails the Preliminary Examination on their second attempt will be dismissed from the Graduate School upon completion of the current academic term and given the option for completing a MS degree instead.

Procedure: Scheduling and Follow-up (Virginia Tech Campus):

At VT the Preliminary Examination must be scheduled through the Graduate School and SHOULD be administered during regular academic semesters. Permission to schedule the exam during the time between semesters or sessions may be granted by a request from the Advisory Committee Chair to the Graduate School Dean explaining the special circumstances. Students must be registered in order to take the exam.

The Graduate School has created an Electronic Signature System for scheduling and completing exams. Students will go to the Forms page on the grad school website and click on “Request to Admit the Candidate to the Preliminary Exam” after which the student logs in with their PID and create a form detailing the time, date, and place of the exam. The form will populate with a chart at the bottom listing the committee names. Committee members will be notified by email to go in and approve the schedule request. Once the approvals are received the graduate school schedules the exam and everyone is officially notified. This same form will be used to track the results of the exam.

The form must reach the Graduate School at least two (2) weeks prior to the date of the exam. In order for the Graduate School deadline to be met students are advised to see the SBES Graduate Coordinator at least three or four weeks in advance in order to address any special situations that may need attention.

Master of Science candidates are not required to do a Preliminary Examination.

SUMMER PRELIM EXAMS: (Virginia Tech Campus)

During summer sessions, students must sign up for a minimum of 3 credits, of BMES 7994 (not under your advisor). Should a student have problems registering, they should contact the Graduate Coordinator to have the 3 credits force added to their record. Students are responsible for covering any costs associated with summer tuition unless the faculty advisor agrees to cover the costs. If the faculty advisor is covering the cost an email should be sent to the Graduate Coordinator with the fund number to be used for covering the cost as well as the total amount to be paid.

Final Examination

All Ph.D. students must pass an oral examination or defense of the dissertation upon completing all other degree requirements and at a minimum of nine (9) months after the preliminary examination. Prior to this examination, a copy of the dissertation approved by the student's major professor shall be provided to each of the committee members at least two (2) weeks prior to the exam. To complete the program, students must pass the final examination, including approval of the dissertation in final form. A student is considered to have passed the examination and have the dissertation approved if they receive no more than one negative vote on the oral examination or on the dissertation. Students are allowed two attempts to pass the final exam. If the first one is not successful, a full semester (15 weeks) must pass before the student can re-schedule the examination with the Graduate School.

At Virginia Tech, to pass any of the required examinations, a graduate student is allowed, at most, one "unsatisfactory" vote. Two or more unsatisfactory votes is considered a fail (not the committee majority). At Wake Forest, to pass any of the required examinations, a graduate student must have all committee members agree to either a pass or a fail.

Doctoral Final Exam Process:

All doctoral candidates must take a final oral examination which is primarily a defense of the dissertation. The exam is to be taken no earlier than nine months after the preliminary examination. Prior to the exam a copy of the dissertation approved by the student's major professor shall be provided to each of the committee members at least two weeks prior to the date of the examination. To complete the SBES program students must pass the final examination, including approval of the dissertation in final form. A candidate is allowed at most one negative vote from the examining committee. In the case of a failure to pass, a full semester (a minimum of 15 weeks) must elapse before rescheduling the examination for a second (and final) attempt. No more than two opportunities to pass any one examination are allowed. A student failing any of the examinations required by Graduate Policies two times will be dismissed from graduate studies by the Graduate School. In the case of any failure, the committee may recommend that the candidate be dropped from the program, change to a MS degree seeking student, or re-take the final examination (only once). If a student decides to downgrade to a MS degree, they may not use their final PhD defense to count as the MS exam. A new MS exam will have to be scheduled a minimum of 15 weeks from the date of the original examination.

Scheduling the Exam (Virginia Tech Campus):

The Ph.D. Final Examination is scheduled through the Graduate School and must be administered during regular academic semesters. Permission to schedule the exam during the time between semesters or sessions may be granted by a request from the Advisory Committee Chair to the Graduate School Dean explaining the special circumstances. Students must be registered in order to take the exam.

The Graduate School has created an Electronic Signature System for scheduling and completing exams. Students will go to the Forms page on the grad school website and click on "Request to Admit the Candidate to Final Exam" after which they'll log in with their PID and create a form detailing the time, date, and place of the exam. The form will populate with a chart at the bottom listing the committee names. Committee members will be notified by email to go in and approve the schedule request. Once the approvals are received the graduate school schedules the exam and everyone is officially notified. This same form will be used to track the results of the exam and the subsequent submission of the thesis/dissertation.

The form must reach the Graduate School at least two (2) weeks prior to the date of the exam. In order for the Graduate School deadline to be met students are advised to see the SBES Graduate Coordinator at least three or four weeks in advance in order to address any special situations that may need attention.

Scheduling the Exam (Wake Forest Campus):

At Wake Forest students submit a form to the Graduate School called 'Intent to Graduate' early in the semester of expected graduation. The deadline to submit the 'Intent to Graduate' form is listed on the academic calendar (<http://graduate.wfu.edu/academic-calendars.html>). Once received, a checklist is generated for the student with a copy sent to the advisor. This checklist outlines the steps needed to prepare for defense and graduation. Students must arrange to meet with the Registrar on or before the deadline (also on the academic calendar) to submit the thesis. This meeting will cover degree finalization paperwork, checking all graduation requirements, and examining a draft of the thesis for formatting issues. Students should arrange the meeting with the Registrar four (4) weeks before the scheduled defense date.

When the time, date, and place of the defense have been decided, the Graduate School is notified. The defense must occur on or before the last day to defend (date posted on the academic calendar). The thesis is sent to the committee three (3) weeks prior to the defense. A defense scheduling memo is sent to the committee with instructions for polling. The ballot for the exam is included in this correspondence. Polling of the committee will take place at least 10 days prior to defense. If the committee finds the thesis acceptable, the defense will proceed as scheduled.

After the Exam (Virginia Tech Campus):

Following the defense, the committee chairperson is required to log into the electronic system and report the exam results on behalf of everyone on the committee, after which emails are sent to each individual committee member asking them to log in and 'approve' the exam results, including the chairperson. This should be done within 1-2 days following the exam. Additionally, the Graduate School requires that the electronic dissertation and all related documents be submitted within two weeks of the final defense. Once the student submits the dissertation to the graduate school, the committee members must log into the system once more to approve the ETD. See the Graduate School's website for specific instructions regarding electronic submission of the M.S. thesis. If an extension of time is required, the student's advisor must email the Graduate School dean to explain why more time is necessary.

Students at the Virginia Tech campus should check the graduate checklist in Hokie Spa as well as see the VT graduate school for requirements in applying for the completion of the degree, acquiring regalia, attending the ceremony and receiving the diploma.

In addition, students who have successfully defended their dissertation will be asked to send a final STAR report, complete an exit survey, and complete an alumni survey.

After the Exam (Wake Forest Campus):

After the exam is held, the committee chair completes the ballot and submits that to the Graduate School. Upon successful completion of the defense the student will complete all necessary revisions under the direction of the committee. The final approved thesis will be submitted via the ETD system. The advisor and student complete the ETD release form and return it to the Graduate School. The ETD as well as any required forms and surveys must be submitted to the Graduate School by the deadline listed on the academic calendar. Students who do not meet the deadlines for graduation on the calendar will be required to register for the next semester and graduation will be moved to the next degree conferral date.

In addition, students who have successfully defended their dissertation will be asked to send a final STAR report, complete an exit survey, and complete an alumni survey.

M.S. Degree “Along-the-way” to the Ph.D. (Both Campuses)

SBES Ph.D. candidates who are on the “direct-to-Ph.D.” path may elect to earn a Master of Science degree on the way to the Ph.D. The student’s official enrollment status remains “Ph.D.” while the M.S. degree is being sought. Students taking this path must submit an M.S. plan of study just as required of regular M.S. candidates. At Wake Forest the degree requires completion of a thesis and defense since there is no non-thesis M.S. degree offered at Wake Forest. The Ph.D. plan of study must be submitted on time at the end of the third semester regardless of the fact that the student is currently working on or finishing up the M.S. degree.

A form to indicate that you wish to do your MS along the way will need to be completed and approved prior to submitting your plan of study and scheduling your MS Defense. Students should meet with the graduate coordinator if they wish to go down this path.

After completing the proper documentation with the VT Graduate School and the SBES program, students on the Wake Forest campus should also notify Susan Pierce spierce@wakehealth.edu of your intentions to proceed with a MS along the way. She will change the student plan in People Soft once notified.

Residency Requirement for the Ph.D. Degree

At least two consecutive semesters of full-time enrollment (at least 12 credit hours per semester) must be completed on the Virginia Tech campus to fulfill the Residency Requirement for Virginia Tech campus students in the SBES program. Individual degree programs, located at sites other than Blacksburg/Roanoke, may request an alternative to the Blacksburg/Roanoke campus requirement by petitioning the VT Graduate School. The Graduate School will report annually to the Commission on Graduate Studies and Policies on the success of the alternative residency. The VT Graduate School retains the right to withdraw the permission for such alternative forms of residency, if deemed necessary.

SBES students on the Wake Forest campus are considered to be Virginia Tech students for purposes of fulfilling the joint program degree requirements; therefore, their residency requirement is inherently met through their time on the Wake Forest campus.

For an explanation of the purpose for the VT Ph.D. Residency Requirement, see the Graduate School's Policies & Procedures on their website: https://secure.graduateschool.vt.edu/graduate_catalog

MD/PHD JOINT DEGREES (Wake Forest Campus)

The combination medical and Ph.D. biomedical engineering degrees are applied for and initially administered under the respective medical programs involved. The M.D. / Ph.D. combination is available only on the Winston- Salem campus. Interested students must first apply directly to the Wake Forest University School of Medicine following the standard application procedures required. During the course of the application process, the student would indicate their interest in the combination degree. Admission to the program only occurs if the student is first accepted into the WFU Medical School, and then is accepted by the normal SBES admissions process into the Ph.D. engineering program. Combination students do NOT apply to the SBES graduate program through the normal route of Virginia Tech's online application process.

The basic degree requirements for the combination degrees will be the same as for the regular BME Ph.D. degree with the exception that the life sciences requirement taken for the M.D. degree will satisfy the life science requirement for the SBES degree, and the clinical rotation requirements for the M.D. degree will satisfy the BME Ph.D. requirement for a clinical rotation. Seminar enrollment is required for 6 semesters, but the credits do not count toward the degree.

More information can be found here: <http://www.wakehealth.edu/School/MD-Program/Combined-Degree-Programs.htm> . See Table 2 below for course requirements.

MBA/PHD JOINT DEGREES (Wake Forest Campus)

The PhD/MBA program is a joint program of the School of Business and the Wake Forest Graduate School of Arts and Sciences. PhD/MBA candidates spend the first two years taking course work in their chosen PhD program of study. Students begin their MBA studies during the third year, taking classes in the School of Business Evening MBA program on the Wake Forest campus. Progression into the MBA portion of the degree is contingent upon successful completion of the qualifying exams administered by the student's program of graduate study and upon passing into doctoral candidacy. Please Note: PhD/MBA students must be recommended from the administration of the Graduate School of Arts and Sciences at Wake Forest University. Candidates for joint degree programs must be accepted by both schools. More information can be found here: <http://business.wfu.edu/joint-degree-programs/phdmba-program/> See Table 2 below for course requirements.

DVM/PHD JOINT DEGREES (Virginia Tech Campus)

The combination D.V.M. / Ph.D. degree program works in a similar manner. Applicants apply to the Virginia-Maryland Regional College of Veterinary Medicine (on the Blacksburg campus) for consideration into its veterinary program. If accepted, the student can then submit application materials to SBES for the engineering (Ph.D.) component of the combination degree. Again, this application process is separate from the one used by non-combination degree applicants.

The basic degree requirements for the combination degrees will be the same as for the regular BME Ph.D. degree with the exception that the life sciences requirement taken for the D.V. M. degree will satisfy the life science requirement for the SBES degree, and the clinical rotation requirements for the D.V.M. degree will satisfy the BME Ph.D. requirement for a clinical rotation. Seminar enrollment is required for 6 semesters, but the credits do not count toward the degree. See Table 2 below for course requirements.

Table 2: Course Requirements for the DVM / PhD, MD / PhD, and the MBA / PhD Joint Degrees

Requirements for those who joined the program BEFORE Fall 2023:

Subject	Course # (VT # / WFU #)	Title	No. Credits Required
Biomedical Engineering (15 credits)	BMES 5054 / 605	Quantitative Cell Physiology (required)	3
	BMES 5064 / 606	Quantitative Organ Systems Physiology (required)	3
	5000 or 6000 level (600 / 700 at WFU)	Min. 9 credit hours of engineering courses approved by committee	9
Life Sciences (3 credits)		<i>Satisfied with DVM and/or MD courses</i>	3**
Mathematics (6 credits – only 3 can be in Statistics)	5000 – 6000 level (600 / 700 WFU)	Min. 6 credit hours (<i>see approved list</i>)	6
Electives (9 - 24 credits)	5000 – 6000 level (600 / 700 at WFU)	Graduate courses in Engineering, Math, or Life Science approved by committee	9 - 24
Clinical Rotation		<i>Satisfied with DVM and/or MD Clinical Rotation requirement</i>	2**
Graduate School Requirements (0 credits)	Required by the Graduate Schools	VT: BMES 5004 and ENGE 5304 WF: GRAD 713, GRAD 714, GRAD 715, and GRAD 716	Does not count toward 90 hours but required by Graduate Schools
BME Seminar	BMES 5944/694	Min. 6 credits (6 semesters) required, additional attendance encouraged!	Does not count toward 90 hours but required by Program
Total Course Requirements:			35 - 50
Dissertation Research (40 – 55 credits)	BMES 7994	Research & Dissertation	40 - 55
Total Minimum Number of Credit Hours			90

PHD Requirements for those who joined the program Fall 2023 and later:

Subject	Course # (VT # / WFU #)	Title	No. Credits Required
Biomedical Engineering (12 credits)	BMES 5054 / 605 OR BMES 5064 / 606	Quantitative Cell Physiology OR Quantitative Organ Systems Physiology (required)	3
	5000 or 6000 level (600 / 700 at WFU)	Min. 9 credit hours of engineering courses approved by committee	9

Life Sciences (3 credits)		<i>Satisfied with DVM and/or MD courses</i>	3**
Mathematics (3 credits)	5000 – 6000 level (600 / 700 WFU)	Min. 3 credit hours (<i>see approved list</i>)	3
Electives (9 - 24 credits)	5000 – 6000 level (600 / 700 at WFU)	Graduate courses in Engineering, Math, or Life Science approved by committee	9 - 24
Clinical Rotation		<i>Satisfied with DVM and/or MD Clinical Rotation requirement</i>	2**
Graduate School Requirements (0 credits)	Required by the Graduate Schools	VT: BMES 5004 and ENGE 5304 WF: GRAD 713, GRAD 714, GRAD 715, and GRAD 716	Does not count toward 90 hours but required by Graduate Schools
BME Seminar	BMES 5944/694	Min. 6 credits (6 semesters) required, additional attendance encouraged!	Does not count toward 90 hours but required by Program
Total Course Requirements:			29 - 44
Dissertation Research (40 – 55 credits)	BMES 7994	Research & Dissertation	46 - 61
Total Minimum Number of Credit Hours			90

** Course credit numbers are the same as for the single SBES Ph.D. degree, but the courses taken to satisfy these hours are not the “normal” SBES courses used in the regular Ph.D. program requirements. Course numbers for both campuses on all classes offered (excluding medical school courses) can be found on the SBES Advising site in Canvas and the SBES website: <https://beam.vt.edu/graduate/biomedical.html>

MASTER OF SCIENCE DEGREE Thesis (Both Campuses)

Students pursuing a BME M.S. degree are required to complete a minimum of 30 total credit hours which may be distributed as follows:

- 21 – 24 credit hours of coursework (5000/6000 at VT 600/700 at WFU)
- 6 -- 9 credit hours of thesis research

Most students spend an average of two years completing the M.S. The degree requirements pertaining to specific courses are shown in the table below. Note that the numbers of credits listed refer to the minimum requirements for the degree. Seminar enrollment is required each semester, but the credits are not counted toward the degree.

Elective requirements for the program are courses that are considered “technical electives” in ENGINEERING, LIFE SCIENCE, or MATH. Students should refer to the list of SBES approved Life Science and Math courses that may be considered as an elective. Courses that begin with GRAD are not considered technical elective courses for the program. A student who feels that a course not listed should be considered, they should send the course information and syllabus to the graduate directors and coordinator for prior approval.

Table 3: Degree Requirements for the M.S. Degree in Biomedical Engineering

Course Category	Course # (VT# / WFU#)	Title	No. Credits Required
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Biomedical Engineering (9 credits)	BMES 5054 / 605	Quantitative Cell Physiology (required)	3
	BMES 5064 / 606	Quantitative Organ Systems Physiology (required)	3
	5000 or 6000 level (600/700 at	3 credit hours of engineering courses approved by committee	3
Life Sciences (3 credits)	5000 – 6000 level (600/700 at WFU)	Min. 3 credit hours approved by committee (<i>see approved list</i>)	3
Math Requirement (3 credits)	5000 – 6000 level	Min. 3 credit hours approved by committee (<i>see approved list</i>)	3
Electives	5000 – 6000 level (600/700 at WFU)	Graduate courses in Engineering, Math, or Life Science approved by committee	6 - 9
Graduate School Requirements (0 credits)	Required by the Graduate Schools	VT: BMES 5004 and ENGE 5304 WF: GRAD 713, GRAD 714, GRAD 715, and GRAD 716	Does not count toward 30 hours but required by Graduate Schools
BME Seminar	BMES 5944/694	Min. 4 semesters required, additional attendance encouraged! UG/GR students must attend while enrolled as graduate students if less than 4 semesters!	Does not count toward 30 hours but required by Program.
		TOTAL COURSE CREDITS:	21 – 24
Research credits	BMES 5994/797	Research & Thesis	6 - 9
		MINIMUM TOTAL CREDITS:	30

NOTE: Course numbers cited above list Virginia Tech campus first (4-digit system), followed by 3-digit numbers at the Wake Forest campus. Course numbers for both campuses on all classes offered can be found on the SBES website: <https://beam.vt.edu/graduate/biomedical.html>

Plan of Study

A draft “Plan of Study” should be created and filed as soon as the student selects an advisory committee and no later than the end of the second (2nd) semester of study. The final plan of study must be approved by the advisory committee and by the SBES Graduate Program chair prior to submission to the Graduate Schools. The plan of study outlines the specific courses to be taken in fulfillment of the degree requirements as outlined in the chart above. A course may only be used once in the plan of study towards the satisfaction of a single requirement.

Final Exam

All M.S. students must pass an oral comprehensive examination given by the advisory committee covering the student’s coursework and thesis research upon completing all other degree requirements. It is important that all students have their final plan of study submitted to the SBES Graduate Coordinator prior to scheduling an exam. A copy of the thesis approved by the student’s major professor should be provided to each of the committee members no less than two weeks prior to the examination. To complete the program students must pass the final examination, including approval of the thesis. A student is considered to have passed the examination and have the thesis approved if they receive no more than one negative vote on the oral exam or on the thesis. Students are allowed two attempts to pass the final exam. If the first one is not successful, a full semester (15 weeks) must pass before the student can re-schedule the examination with the Graduate School.

At Virginia Tech, to pass any of the required examinations, a graduate student is allowed, at most, one “unsatisfactory” vote. Two or more unsatisfactory votes is considered a fail (not the committee majority). At Wake Forest, to pass any of the required examinations, a graduate student must have all committee members agree to either a pass or a fail.

M.S. Final Exam Procedures:

All M.S. students must pass a final exam consisting of an oral presentation and defense of the thesis research before the student’s advisory committee. The exam takes place after the completion of all other degree requirements. A copy of the thesis approved by the student’s major professor should be provided to each of the committee members no less than two weeks prior to the examination. In order to ‘pass’ the candidate is allowed at most one negative vote from the examining committee. If a student fails the final examination, one full semester (a minimum of 15 weeks) must elapse before the second examination can be scheduled. The candidate is allowed no more than two opportunities to pass the exam. Failure the second time will result in dismissal from graduate studies by the Graduate School.

Scheduling the Exam (Virginia Tech Campus):

The Final Exam is scheduled through the Graduate School and must be administered during regular academic semesters. Permission to schedule the exam during the time between semesters or sessions may be granted by a request from the Advisory Committee Chair to the Graduate School Dean explaining the special circumstances. Students must be registered to take the exam.

The Graduate School has created an Electronic Signature System for scheduling and completing final exams. Students will go to the Forms page on the grad school website and click on “Request to Admit the Candidate to Final Exam” after which they’ll log in with their PID and create a form detailing the time, date, and place of the exam. The form will populate with a chart at the bottom listing the committee names. Committee members will be notified by email to go in and approve the schedule request. Once the approvals are received the graduate school schedules the exam and everyone is officially notified. This same form will be used to track the results of the exam and the subsequent submission of the thesis/dissertation.

The form must reach the Graduate School at least two (2) weeks (or longer) prior to the date of the exam. In order for the Graduate School deadline to be met students are advised to see the SBES Graduate Coordinator at least three or four weeks in advance in order to address any special situations that may need attention.

Scheduling the Exam (Wake Forest Campus):

At Wake Forest students submit a form to the Graduate School called ‘Intent to Graduate’ early in the semester of expected graduation. The deadline to submit the ‘Intent to Graduate’ form is listed on the academic calendar (<http://graduate.wfu.edu/academic-calendars.html>). Once received, a checklist is generated for the student with a copy sent to the advisor. This checklist outlines the steps needed to prepare for defense and graduation. Students must make arrange to meet with the Registrar on or before the deadline (also on the academic calendar) to submit the thesis. This meeting will cover degree finalization paperwork, checking all graduation requirements, and examining a draft of the thesis for formatting issues. Students should arrange the meeting with the Registrar four (4) weeks before the scheduled defense date.

When the time, date, and place of the defense have been decided, the Graduate School is notified. The defense must occur on or before the last day to defend (date posted on the academic calendar). The thesis is sent to the committee three (3) weeks prior to the defense. A defense scheduling memo is sent to the committee with instructions for polling. The ballot for the exam is included in this correspondence. Polling of

the committee will take place at least 10 days prior to defense. If the committee finds the thesis acceptable, the defense will proceed as scheduled.

After the Exam (Virginia Tech Campus):

Following the completion of the M.S. defense, the committee chairperson is required to log into the electronic system and report the exam results on behalf of everyone on the committee, after which emails are sent to each individual committee member asking them to log in and 'approve' the exam results, including the chairperson. This should be done within 1-2 days following the exam. Additionally, the Graduate School requires that the electronic thesis and all related documents be submitted within two weeks of the final defense. Once the student submits the thesis to the graduate school, the committee members must log into the system once more to approve the ETD. See the Graduate School's website for specific instructions regarding electronic submission of the M.S. thesis. If an extension of time is required, the student's advisor must email the Graduate School dean to explain why more time is necessary.

After the Exam (Wake Forest Campus):

After the exam is held, the committee chair completes the ballot and submits that to the Graduate School. Upon successful completion of the defense the student will complete all necessary revisions under the direction of the committee. The final approved thesis will be submitted via the ETD system. The advisor and student complete the ETD release form and return it to the Graduate School. The ETD as well as any required forms and surveys must be submitted to the Graduate School by the deadline listed on the academic calendar. Students who do not meet the deadlines for graduation on the calendar will be required to register for the next semester and graduation will be moved to the next degree conferral date.

MASTER OF SCIENCE DEGREE- Non-Thesis Option (VT Campus)

Students pursuing a BME Non-Thesis M.S. degree are required to complete a minimum of 30 total credit hours which may be distributed as follows:

- 27 credit hours of coursework (5000/6000)
- 3 credit hours of project and report

Most students spend an average of one and a half to two years completing the M.S. The degree requirements pertaining to specific courses are shown in the table below. Note that the numbers of credits listed refer to the minimum requirements for the degree. Seminar enrollment is required each semester, but the credits are not counted toward the degree.

Elective requirements for the program are courses that are considered "technical electives" in ENGINEERING, LIFE SCIENCE, or MATH. Students should refer to the list of SBES approved Life Science and Math courses that may be considered as an elective. Courses that begin with GRAD are not considered technical elective courses for the program. A student who feels that a course not listed should be considered, they should send the course information and syllabus to the graduate directors and coordinator for prior approval. Track elective courses (3-6 credit hours) and BMES 5904 (Project & Report) (3 credit hours) are required for students with the non-thesis MS degree option while research credits (6-9 credit hours) are required for students with the thesis-based MS degree option.

Table 3: Degree Requirements for the Non-Thesis M.S. Degree in Biomedical Engineering

Course Category	Course # (VT# / WFU#)	Title	No. Credits Required
Biomedical Engineering (9 credits) (Core)	BMES 5054	Quantitative Cell Physiology (required)	3
	BMES 5064	Quantitative Organ Systems Physiology (required)	3
	5000 or 6000 level	3 credit hours of engineering courses	3
Life Sciences (3 credits) (Core)	5000 – 6000 level	Min. 3 credit hours <i>(see approved list)</i>	3
Math (3 credits) (Core)	5000 – 6000 level	Min. 3 credit hours <i>(see approved list)</i>	3
Electives	5000 – 6000 level	Graduate courses in Engineering, Math, or Life Science	6 - 9
Track Electives	5000-6000 level	Graduate course(s) in the BME track elective courses	3 - 6
Project and Report	BMES 5904	Project and Report	3
Graduate School Requirements (0 credits)	Required by the Graduate Schools	VT: BMES 5004 and ENGE 5304 WF: GRAD 713, GRAD 714, GRAD 715, and GRAD 716	Does not count toward 30 hours but required by Graduate Schools
BME Seminar	BMES 5944	Min. 4 semesters required, additional attendance encouraged! UG/GR students must attend while enrolled as graduate students if less than 4 semesters!	Does not count toward 30 hours but required by Program.
		TOTAL COURSE CREDITS:	30
		MINIMUM TOTAL CREDITS:	30

In addition to the core courses (15 course credit hours) and technical elective courses (6-9 course credit hours), students are allowed to select track elective courses (3-6 course credit hours) depending on their selection of BMES track and BMES 5904 (Project & Report) to fulfill the course requirement for a non-thesis MS degree option. The approved courses meeting track electives requirement for the non-thesis option are listed in Table 4. Students who would like to take a class not listed in Table 4 must receive approval for a given track elective course from the graduate program director before taking the course.

Table 4: The list of approved track elective courses for the non-thesis option BMES Track	Approved Track Electives
Automotive Vehicle Safety	BMES 5174 (ME 5174): Biomechanics of Crash Injury Prevention BMES 5234: Advanced Vehicle Safety Systems BMES 6164 (ESM 6164): Computational Modeling in Impact Biomechanics BMES 6174: Advanced Human Modeling: Injury and Tissue Biomechanics
Biomechanics	BMES 5124/ESM 5224: Advanced Musculoskeletal Biomechanics BMES 5164: Advanced Impact Biomechanics BMES 5204 (ME 5204): Laboratory Techniques in Injury Prevention BMES 5214 (BMVS 5224): Human Physical Capabilities

	BMES 6174: Advanced Human Modeling: Injury and Tissue Biomechanics BMES 6194: Advanced Movement Assessment ESM 5014: Introduction to Continuum Mechanics ESM 5024: Introduction to Solid Mechanics ESM 5054: Introduction to Fluid Mechanics ESM 5124 Theory of Elasticity ESM 5245G/5246G: Mechanics of Animal Locomotion ESM 5305: Mechanics of the Cardiovascular System ESM 5734 Introduction to Finite Element Method ESM 6024: Soft Tissue Mechanics HNFE 5474: Human Exercise Testing: Physiology & Biomechanics
Biomaterials and Nanobioengineering	BMES 5434: Polymeric Biomaterials BMES 5574: Advanced Biomaterials BMES 5724: Biomedical Nanoengineering MSE 5614: Advanced Nanomaterials
Biomedical Devices & Entrepreneurship	BMES 5154G: Advanced Commercialization of Biomedical Engineering Research BMES 5714: Biomedical Microdevices ACIS/BIT/FIN/HTM/MGT/MKTG 5000+ (College of Business)
Tissue Engineering & Regenerative Medicine	BMES 5314: Introduction to Regenerative Medicine BMES 5324: Advanced Topics in Regenerative Medicine TBMH 5064: Fundamentals of Tissue Engineering & Reparative Medicine
Translational Cancer Engineering	BMES 5604: Cancer Detection and Therapeutics BMES 5614: Multiscale Cancer Engineering HNFE 5164: Molecular Aspects of Diet and Cancer TBMH 5024: Fundamentals of Cancer

Plan of Study

A draft “Plan of Study” should be created and filed no later than the end of the second (2nd) semester of study. The final plan of study must be approved by the SBES Graduate Program chair prior to submission to the Graduate Schools. The plan of study outlines the specific courses to be taken in fulfillment of the degree requirements as outlined in the chart above. A course may only be used once in the plan of study towards the satisfaction of a single requirement.

Final Exam

The Final Examination (Master’s) section of Graduate School Policies in the Graduate Catalog (https://secure.graduateschool.vt.edu/graduate_catalog/policies.htm?policy=002d14432c654287012c6542e363001a) describes “An oral and/or written final examination or evaluation is required in all master’s programs. For some non-thesis master’s programs, final exams are structured in special ways, including evaluation of a project as the final examination. For non-thesis, coursework-only master’s degree programs, the committee will conduct a final evaluation of the student’s record to confirm degree completion. All master’s final examinations and non-thesis, coursework-only evaluations are scheduled through the Electronic Scheduling System.” Based on the graduate school policy regarding the non-thesis master’s degree program as described above, the BEAM graduate program director, who will serve as the student’s major advisor, will conduct a final

confirmation of completing all degree requirements by reviewing and evaluating the student's coursework record.

ACCELERATED UNDERGRADUATE/GRADUATE (UG/G) DEGREE (VT Campus)

SBES invites application to the Accelerated Undergraduate/Graduate Degree Program (UG/G) for highly qualified VT undergraduate engineering students. Students may apply for admission to either the SBES M.S. or the Ph.D. program as part of this program. Application to this program is available to VT engineering students who meet the following qualifications:

- Students must have a GPA of 3.3 or higher if applying for the terminal MS degree
- Students must have a GPA of 3.5 or higher if applying for the direct PhD degree.
- A SBES faculty member (primary or affiliate) must have agreed to serve as the initial faculty advisor for the student's graduate degree.
- Students follow the regular graduate admissions process. Students must apply for the semester they will begin their graduate degree not the year they are dual enrolled.
- Students applying to the program are not required to submit GRE scores but may do so if they wish.
- Students must submit three or more letters of recommendation.
- Applicants must be in the last 12 months of an undergraduate program from one of the Virginia Tech College of Engineering departments to be eligible.

Double-Counting Courses

Acceptance into the program allows the student to 'double-count' up to 12 hours (or up to four courses) of graduate-level coursework towards the undergraduate and graduate degree. This must be chosen in advance and taken during the senior year. All double-counted courses must be at the 5000-level or higher. Courses included on a UG/G student's list of proposed coursework must be consistent with the course requirements for the appropriate SBES graduate degree. They must also meet the requirements of the student's undergraduate degree program. Students may NOT triple count a course for the BS degree, the MS degree, and the PhD degree! Students are discouraged from taking BMES 5054, BMES 5064, BMES 5944, BMES 5994/7994 while they are still undergraduates and should wait to take these once they are full time graduate students.

Application Instructions

The deadline for applying to this program is June 1 for students who are finishing up their junior year. We recommend that applicants begin this process at the beginning of the spring semester of their junior year if possible. Participation in this program requires the student to work closely (and well in advance) with the advising offices of both departments to ensure that requirements for both degrees (undergraduate and graduate) are met without conflict. The student should confer with the SBES Graduate Coordinator as well as the undergraduate advisor in their 'home' department in order to choose the courses which will be double-counted. Applicants should apply through the normal VT online application process and choose the semester/year following their completion of the B.S. degree. For example, if a student will be a senior during the Fall 2024-Spring 2025 academic year and plans to complete their B.S. degree in Spring 2025, they should apply for Fall 2025 (not Fall 2024).

NOTE: Students are advised to consult with the SBES Graduate Coordinator before beginning to work on the application and the Course Designation Form. Students should also notify the SBES Graduate Coordinator once they have submitted their application.

Campus Location

Students in this program will be assumed to finish their graduate degree at the Virginia Tech campus only. Ideally, students will begin doing some research with their faculty advisor during their final undergraduate year so that they stay on track to graduate on time.

If a student wishes to transfer their graduate degree to the Wake Forest Campus they may do so but it is discouraged. Students should note that it will be up to the discretion of the Wake Forest Graduate School to determine if coursework taken during the final undergraduate year will be allowed to count towards the graduate degree (this is not guaranteed). It is also important for students to note that transferring their campus location will add to their time limit in the program. Since research most likely cannot begin until the student is a graduate student at the other campus, graduation plans will be delayed. Students should also note that the Wake Forest Campus has different tuition rates and graduate funding assistance which is not guaranteed nor common for students pursuing a MS degree.

SBES ACADEMIC REQUIREMENTS WITHIN THE DEGREE (Both Campuses)

In addition to the general course credit minimums established for degree conferral, there are certain other academic requirements that must be met by all SBES students which are presented below.

Math Requirement

- An M.S. degree student must complete a minimum of three (3) course-hours approved by the advisory committee.
- A Ph.D. degree student must complete a minimum of six (6) course-hours approved by the student's advisory committee. No more than three hours may be in statistics; however, the math requirement does not require statistics.

Courses offered at Virginia Tech and at Wake Forest that are approved for the math requirement are listed below. Engineering courses often have considerable mathematics content; however, these courses will not count toward the mathematics requirement but can be used to fulfill the engineering course requirement. Students who would like to take a class not listed below should first get permission of their major advisor and then submit a request to the chair of the graduate program committee. (Students are encouraged to investigate this option as we cannot anticipate all the math courses that could be available or would be applicable for an individual student's needs.)

Approved Virginia Tech Math Courses for SBES Mathematics Requirement:

- MATH - Any 5000-level or higher course with some exceptions*
- STAT - Any 5000-level or higher course with some exceptions*
- CHE/BSE/BMES 5044 - Engineering Mathematics
- ME 5744 - Methods of Mechanical Engineering Analysis
- BMES 5074 Biomedical Research Design

- ESM 5014 Intro to Continuum Mechanics

* Confirm with your Advisor(s) and the Graduate Directors/Graduate Coordinator

The following MATH and STAT courses do **NOT** meet the SBES mathematics requirement at the Virginia Tech campus:

- MATH 5984 - Final Examination
- MATH 5974 - Independent Study
- MATH 5994 - Research & Thesis
- MATH 7994 - Research & Dissertation
- STAT 5984 - Final Examination
- STAT 5904 - Project & Report
- STAT 5924 - Graduate seminar
- STAT 5974 - Independent Study
- STAT 5994 - Research & Thesis
- STAT 7994 - Research & Dissertation

Approved Wake Forest Courses for SBES Mathematics Requirement:

- BIO 680 – Biostatistics
- CRM 732 - Data Management
- HES 721 - Data Analysis and Interpretation
- MATH - Any 600 level or higher with some exceptions*
- NEUR 751- Advanced Multivariate Analysis in Neuroscience
- STA - Any 600 level or higher with some exceptions*
- CSC 655: Intro to Numerical Methods
- CSC 652: Numerical Linear Algebra
- CSC 675: Neural Networks and Deep Learning
- THSS 720: Epidemiology
- THSS 730: Introduction to Biostatistics
- THSS 731: Introduction to Biomedical Informatics of the Learning Healthcare System
- THSS 732: Statistical Modeling

* Confirm with your Advisor(s) and the Graduate Directors/Graduate Coordinator

Suggested Wake Forest Math Courses for Biomedical Imaging, Medical Physics, and Biomechanics concentrations:

- MATH 617 - Complex Analysis
- MATH 624 - Linear Algebra II
- MATH 626 - Numerical Linear Algebra
- MATH 652 - Partial Differential Equations
- MATH 655 - Introduction to Numerical Methods
- MATH 717 - Optimization in Banach Spaces
- MATH 753/CSC 752 - Nonlinear Optimization
- MATH 757 - Stochastic Processes and applications

Suggested Wake Forest Math Courses for Tissue Engineering concentrations:

- MATH 624 - Linear Algebra II
- MATH 626 - Numerical Linear Algebra
- MATH 652 - Partial Differential Equations
- MATH 753 - Nonlinear Optimization

Life Science Requirement

Life sciences are sciences that are focused on the study of living organisms and life processes of living organisms. Life sciences include but are not limited to: botany, ecology, biology, microbiology, neurobiology, molecular biology, biophysics, biochemistry, medicine, pharmacology, zoology, veterinary science/ medicine, entomology, bioinformatics, physiology, anatomy and morphology, genetics, immunology, epidemiology, and endocrinology.

In order to fulfill the life science requirement for the Ph.D. degree in Biomedical Engineering students must acquire a minimum of three (3) credit hours in approved life science coursework beyond the required courses that contain life science content, i.e., Quantitative Cell Physiology (BMES 5054) and Quantitative Organ Systems Physiology (BMES 5064). These hours can be earned by enrollment in one or more upper division life science courses offered through one of three possible avenues:

Approved BMES Life Science Courses (Both campuses):

The following BMES courses have been designated as 'life science' courses suitable for degree requirements. At this time there are three choices:

- BMES 5184/618 - Injury Physiology
- BMES 5024/602 - Biomedical Engineering and Human Disease

Courses Meeting Life Science Requirement (Virginia Tech campus):

Courses outside of SBES meeting the life science requirement on the 5000 and 6000 level courses only from the following departments, but cannot include seminar, research credits, or professional development courses, e.g. BIOL 5154.

- ALS - Agriculture and Life Sciences - Any 5000-level or higher course with some exceptions*
- APSC 5604 – Grant Writing
- BIOL – Biology - Any 5000-level or higher course with some exceptions*
- BCHM – Biochemistry - Any 5000-level or higher course with some exceptions*
- BMES 5984 - SS: Functional Anatomy for Engineers
- BMVS - Biomedical & Veterinary Sciences - Any 5000-level or higher course with some exceptions*
- ENT – Entomology - Any 5000-level or higher course with some exceptions*
- GBCB - Genetics Bioinformatics, Computational Biology - Any 5000-level or higher course with some exceptions*
- HNFE 5164 - Molecular Diet and Cancer
- HNFE 5474 - Human Exercise Testing: Physiology and Biomechanics
- HNFE 5214 – Physical Activity and Health
- NEUR – Neuroscience - Any 5000-level or higher course with some exceptions*
- PSYC 5344 - Cognitive Psychology
- TBMH - Translational Biology, Medicine, and Health - Any 5000-level or higher course with some exceptions*
- VM - Veterinary Medicine - Any 5000-level or higher course with some exceptions*

* Confirm with your Advisor(s) and the Graduate Directors/Graduate Coordinator

Students should be aware that many courses listed in the above departments carry prerequisites and/or restrictions which would not make them suitable for all students. For example, in the Vet School any course designated VM is restricted to professional veterinary students. It is the student's responsibility to examine the course descriptions, prerequisites, and/or restrictions in order to determine whether they have sufficient academic background to enroll in a particular course. If course descriptions fail to specify prerequisites and/or restrictions for registration, the student may find it useful to directly contact the department or the faculty member teaching the class.

Courses Meeting Life Science Requirement (Wake Forest campus):

Courses outside of SBES meeting the life science requirement on the students may use 600 and 700 level courses from the following departments, but cannot include seminar, research credits, or professional development courses.

- BAMB - Biochemistry and Molecular Biology - Any 600 level or higher with some exceptions*
- BMES 631- Intro to Regenerative Medicine
- BMSC - Biomedical Sciences - Any 600 level or higher with some exceptions*
- BIO - Biology - Any 600 level or higher with some exceptions*
- CABI - Cancer Biology - Any 600 level or higher with some exceptions*
- IPP - Integrative Physiology and Pharmacology - Any 600 level or higher with some exceptions*
- MCB - Molecular and Cellular Biosciences - Any 600 level or higher with some exceptions*
- MICR - Microbiology and Immunology - Any 600 level or higher with some exceptions*
- MOGN - Molecular Genetics and Genomics - Any 600 level or higher with some exceptions*
- MMTS - Molecular Medicine and Translational Science - Any 600 level or higher with some exceptions*
- MPHY – Medical Physics- Any 700 level or higher with some exceptions*
- NEUR- Neuroscience - Any 600 level or higher with some exceptions*
- HES 650- Human Physiology
- HES 653- Physiology of Exercise
- HES 763- Advanced Biomechanics
- HES 670 Biomechanics of Human Movement
- HES 675 - Advanced Exercise Physiology
- HES 780 – Advanced Topics in Exercise and Sport Science
- PSY 720 – Biological Psychology
- PSY 728 – Human Cognition

* Confirm with your Advisor(s) and the Graduate Directors/Graduate Coordinator

Questions about specific courses in these or other departments should be directed to the WFU Program Director. It is the student's responsibility to examine the course descriptions, prerequisites, and/or restrictions in order to determine whether they have sufficient academic background to enroll in a particular course. If course descriptions fail to specify prerequisites and/or restrictions for registration, the student may find it useful to directly contact the department or the faculty member teaching the class.

Requesting Approval for Courses Not Listed Above to Serve as a Life Science Course:

Given that new or existing courses not currently listed above may meet the requirements to serve as a life science course, the Graduate Committee is always willing to evaluate whether or not a given course meets the requirements to serve as a life science course.

In order to qualify as a life science course, the following requirements must be met:

1. Graduate Level Course (i.e., 5000-6000 level courses at VT, and 600-700 level courses at WFU)
 - a. Courses listed in the graduate catalog and Special Studies (SS) courses can be acceptable
 - b. Independent studies, seminar, research, and professional development courses are not acceptable
2. >50% of the course is dedicated to the knowledge, understanding, and/or application of life science principles and/or subject matter (see previous description and examples of life sciences)

Students wishing to petition for the approval of a course to serve as a life science course should send their request to the SBES graduate coordinator, along with the following:

1. A short explanation of their interest in the course
2. A short justification for why the course should qualify to serve as a life science course
3. A detailed course syllabus that includes the course title, course number, course description, learning objectives, prerequisites, and list of topics covered.

** Students wishing to petition for the approval of a course should determine whether he/she has sufficient academic background to enroll in a particular course (i.e., prerequisites and/or restrictions) and confirm with their advisor and/or the graduate chairs **before** submitting a petition.*

Engineering Requirements

The following have been approved as Engineering courses and may count for Engineering or Elective credit.

Courses meeting Engineering Requirement (Virginia Tech campus):

- AOE: Aerospace and Ocean Engineering - Any 5000 level or higher with some exceptions*
- BSE: Biological Systems Engineering - Any 5000 level or higher with some exceptions*
- BMES: Biomedical Engineering - Any 5000 level or higher with some exceptions*
- CHE: Chemical Engineering - Any 5000 level or higher with some exceptions*
- CEM: Construction Engineering and Management - Any 5000 level or higher with some exceptions*
- CEE: Civil and Environmental Engineering - Any 5000 level or higher with some exceptions*
- CS: Computer Science - Any 5000 level or higher with some exceptions*
- ECE: Electrical and Computer Engineering - Any 5000 level or higher with some exceptions*
- ENGE: Engineering Education - Any 5000 level or higher with some exceptions*
- ENGR: Engineering - Any 5000 level or higher with some exceptions*
- ESM: Engineering Science and Mechanics - Any 5000 level or higher with some exceptions*
- ISE: Industrial and Systems Engineering - Any 5000 level or higher with some exceptions*
- MACR: Macromolecular Science and Engineering - Any 5000 level or higher with some exceptions*
- MSE: Materials Science Engineering - Any 5000 level or higher with some exceptions*
- MINE: Mining Engineering - Any 5000 level or higher with some exceptions*
- NSEG: Nuclear Science and Engineering - Any 5000 level or higher with some exceptions*

Courses meeting Engineering Requirement (Wake Forest campus):

- BMES: Biomedical Engineering - Any 600 level or higher with some exceptions*
- CSC: Select Computer Science courses at 600 level or higher
- GRAD 706: Reg. & Reimb. of Novel Drugs, Biol., and Med. Devices
- Graduate Level Courses from WF Engineering Programs (please check with SBES program first!)

Technical Electives Requirement

The elective requirements for the MS and PhD programs are courses that are considered “technical electives” in ENGINEERING, LIFE SCIENCE, or MATH. Students may use any combination of approved engineering, life science, and math courses to fulfill the electives requirement for a given degree (i.e. 9-24 credits for PhD, and 6-9 credits for MS). However, students must receive approval for a given technical elective from their advisor and/or the graduate chairs before taking the course. In addition, the student’s graduate committee members must ultimately approve of the chosen technical electives when approving the plan of study.

Information regarding the criteria for each type of elective (i.e. engineering, life science, or math) that must be met for a course to serve as a technical elective is provided below. It should be noted that courses that begin with GRAD are not considered technical elective courses for the program. If a student is uncertain whether or not a course qualifies to serve as a technical elective or feels that a course not listed should be considered, they should send the course information and syllabus to the SBES graduate coordinator and/or Graduate Committee for prior approval.

Engineering Technical Electives:

Students may elect to use engineering course credits, beyond those taken to fulfill the biomedical engineering requirement for a given degree, to serve as technical elective credits. In order to qualify as an engineering technical elective course, the following requirements must be met:

1. Graduate Level Course (i.e. 5000-6000 level courses at VT, and 600-700 level courses at WFU)
 - a. Courses listed in the graduate catalog and Special Studies (SS) courses can be acceptable
 - b. Independent Studies may be acceptable, but must first be approved by the graduate committee.
 - i. No more than **two** Independent Study (max 6 credits) can be used as a technical elective.
 - ii. Students wishing to petition for the approval of an Independent Study to serve as an engineering technical elective should send their request to the SBES graduate coordinator, along with the following:
 1. A short justification for why the course should qualify to serve as an engineering technical elective
 2. A detailed course syllabus that includes the course title, course number, course description, learning objectives, justification, method of assessment, prerequisites/ requisites, textbooks/ teaching aids, and list of topics covered.
 - c. Seminar, research, and professional development courses are not acceptable
2. >75% of the course is dedicated to the knowledge, understanding, and/or application of engineering principles and/or subject matter.
3. Course content and learning objectives have a clear, logical association/ connection with the student’s thesis/ dissertation topic and/or field of study.
 - a. Decisions regarding the applicability/ relevance of a given engineering course are generally left to the discretion of the student’s advisor and/or the graduate chairs. However, the graduate committee reserves the right to ask for justification and/or disallow courses that do not appear relevant to/ associated with a given student’s thesis/ dissertation topic and/or field of study.
4. Course is offered by one of the following engineering departments listed previously

Students should be aware that many engineering courses offered by other departments carry prerequisites and/or restrictions, which would not make them suitable for all students. It is the student's responsibility to examine the course descriptions, prerequisites, and/or restrictions in order to determine whether he/she has sufficient academic background to enroll in a particular course. If course descriptions fail to specify prerequisites and/or restrictions for registration, the student may find it useful to directly contact the department or the faculty member teaching the class.

Life Science Technical Electives:

Students may elect to use life science course credits, beyond the required courses that contain life science content or those taken to fulfill the life science requirement for a given degree, to serve as technical elective credits. Life science courses offered at Virginia Tech and at Wake Forest that are approved to serve as technical electives are the same as those approved to fulfill the life science requirement. Students should refer to the "Life Science Requirement" section of this document for additional information in regard to SBES approved life science courses and the procedures for requesting approval for courses not listed as approved.

Math Technical Electives:

Students may elect to use math course credits, beyond those taken to fulfill the math requirement for a given degree, to serve as technical elective credits. Math courses offered at Virginia Tech and at Wake Forest that are approved to serve as technical electives are the same as those approved to fulfill the math requirement. Students should refer to the "Math Requirement" section of this document for additional information in regard to the list of SBES approved math courses.

Seminar Requirement

All entering graduate students are required to complete the BMES 5944/BME 694, BME Seminar.

This course is taught every fall and spring semester. During the fall semester, the seminar faculty leader will cover topics of particular relevance to the Ethics and Integrity requirements in addition to a special series of lectures on a range of issues including good research practices, strategies to write a fellowship application, e.g., for NIH or NSF, oral communication, and a number of professional development topics such as how to prepare for their first conference talks. Attendance is taken at this seminar and will be recorded in the student's departmental record.

As stated, all entering SBES graduate students must satisfy these requirements. When students submit their plans of study for Program and Graduate School approval, the completion of seminar, ethics, and diversity requirements should be listed under the "Supporting Courses". The graduate advisor will notify students if additional requirements are needed.

All SBES degree-seeking students are required to register for and complete a one-credit BMES Seminar course during their academic career. Beginning Spring 2020, PhD students will be required to register and complete a minimum of 6 credits (i.e. 6 semesters of seminar) and MS students will be required to register and complete a minimum of 4 credits (i.e. 4 semesters of seminar).

Accelerated Undergraduate/Graduate students should only attend Seminar when they are a full graduate student and should be enrolled for as many seminar semesters as they can take until graduation but no more than 4 for MS and 6 for PhD is required. Should a UG/GR MS student finish their degree in 1 year of graduate school, they may note only 2 semesters of seminar on their plan of study.

Separate of credits/mandatory attendance, we should remember that it is always a “good look” when our invited speakers (whether internal or external) are greeted by a full room of students/faculty.

Seminar is meant to encourage SBES students to enhance their academic/research development by attending talks/presentations on subjects pertinent to their own programs, projects, and professional interests. The course will include the already existing requirements to attend 5 external speaker seminars. Course content will also include topics such as mentorship, literature review, scientific writing, grant writing, fellowships and other sources of funding, research ethics, entrepreneurship, presentation skills, and alternative careers in science and engineering.

Seminar credits must be recorded on the plan of study, but will not be included in the calculation of credits required to earn the graduate degrees. The credits will be treated on the plan in the same manner as supporting courses – extra credits not counting toward the degree. Details regarding seminar attendance, course content, meeting schedules, etc. will be conveyed during the first meeting by the course instructor and on Canvas. Please note that students who do not meet the full seminar requirements will be given an “F” in the course which will in turn effect your overall GPA.

The following set of requirements applies to class enrollment in the specific case of a non-SBES student wishing to take an SBES course at the partner campus (i.e. a non-SBES student enrolled at VT wishing to take an SBES class originating at WFU or vice versa). 1. The advisor of the student must be an SBES primary or affiliate faculty on either campus. 2. The class must be cross listed, and the student must enroll in the section on their home campus. 3. The course must be set up for distance learning and the instructor at VT or WFU must agree to allow the student to enroll (e.g., enrollment doesn’t exceed the cap). Non-SBES Students who wish to enroll in SBES courses originating at their home campus (e.g., a non-SBES VT student wishing to take an SBES class at VT or vice versa) only require instructor permission to enroll.

Student Research Symposium

At the end of the spring semester SBES hosts an annual graduate student Research Symposium which is held at each campus location rotating on alternate years. This is an all-day conference at which students present their research through posters and/or oral presentations, and it is one of the major events that allow the students from both campuses to share in a significant academic experience. SBES degree-seeking students must present either a poster or podium talk at the Symposium as one of the requirements of the program.

The following guidelines govern the attendance/presenting requirements for both SBES degree-seeking students and students from other engineering majors seeking the BME option:

- BME-Option students are required to attend and participate in the symposium as part of the general requirements for obtaining the BME Option and must present a poster each year.
- UG/GR Students who are still undergraduate students are encouraged to attend and participate with a poster but are not required to attend or present a poster until they become full graduate students.
- Direct 1st year MS/PhD SBES Graduate Students are required to attend the symposium and encouraged to present a poster (but not required to) until their 2nd year.
- Any students may elect to give an oral presentation if time allows. Students should discuss this decision with their advisor(s). Please note that preference is given to graduating students first.
- All SBES degree-seeking students who will or have defended the spring semester of the symposium, or the plan to defend the following summer/fall semesters, are required to give an oral presentation if they have not done so previously.

- One oral presentation PER degree earned is required for all defending SBES Graduate Students. If you are a MS/PhD student you will be doing 2 oral presentations (one for the MS degree and one for the PhD degree).
- All participating students must submit (as directed) written abstracts of the research projects which are published in a Symposium Program book given to all attendees.

Inclusion and Diversity / Ethics Requirements (Required by VT and WF Graduate Schools)

Beginning Fall 2021, all SBES students must include the following on the Plan of Study for the Scholarly Ethics and Integrity requirement:

1. All entering SBES graduate students are required to attend a half-day orientation prior to the beginning of the fall semester. Attendance is taken at this orientation and will be recorded in each student's departmental record. At this orientation the University and SBES policies and procedures as well as Ethics and Integrity Requirements will be presented, and students will be informed of the timeline for satisfying these requirements.
2. All new graduate students at the Virginia Tech campus are required to complete the BMES 5984 (*permanent course number TBD*): "BME Ethics Professional Development" during their first fall semester. The instructor of this course will cover (a) plagiarism and other violations of the Graduate Honor Code. (b) proper use of professional conventions in citation of existing research and scholarship, accurate reporting and ownership of findings, and acknowledgement of contributions to the work (c) ethical standards in teaching, mentoring, and professional activities (d) avenues for reporting alleged misconduct (e) appropriate research protocols involving human and animal subjects: Institutional Review Board (IRB) and Institutional Animal Care and Use Committee (IACUC) and (e) oral and written communications across boundaries to create a diversity statement for professional use as required by the Virginia Tech Graduate School Ethics requirements. Attendance will be taken and completion will be recorded in the student's departmental record and plan of study. In addition, students will be required to successfully complete the NIH Responsible Conduct of Research (RCR), Conflict of Interest (COI), Biomedical Research, IRB, and IACUC online courses created and maintained by the Collaborative Institutional Training Initiative (CITI) to satisfy additional Virginia Tech requirements.
3. All new graduate students at the Wake Forest campus are required to complete the Wake Forest University Ethics courses including: GRAD 712: Clinical Integrity & Professionalism, GRAD 713: Foundations of Scientific Integrity & Professionalism, GRAD 714: Scientific Integrity and Professionalism, GRAD 715: Career Planning for Biomedical Sciences, and GRAD 716: Seminars in Professional Development which meets the requirements of the Wake Forest Graduate School Ethics Requirements.
4. All SBES graduate students are required to attend the BMES 5944 BME Seminar course which are a special series of lectures that cover a wide range of topics beyond the ethics requirements at each campus. Topics include good research practices, strategies to write a fellowship application, e.g., for NIH or NSF, oral communication, and a number of professional development topics such as how to prepare for their first conference talks, networking, and biomedical research.

As stated, all new SBES graduate students must satisfy these requirements. When students submit their plans of study for Departmental and Graduate School approval, the completion of SBES Ethics and Integrity Requirement will be noted.

The proposed procedure for the SBES Ethics and Integrity Requirement satisfies the four required topics enumerated in the Appendix to CGS&P Resolution 2012-13B in the following specific ways.

Required Topic 1: Plagiarism and other violations of the Graduate Honor Code

The definition of plagiarism and responsibilities of graduate students as research participants is covered in the first module of the CITI online course entitled "Introduction to Responsible Conduct of Research." Specific examples and information on best practices are given within the following modules: "Research Misconduct," "Publication Practices and Responsible Authorship," and "Data Acquisition, Management, Sharing and Ownership." In addition, as part of the BMES 5984 BME Ethics Professional Development course students will be introduced to Virginia Tech resources on plagiarism and other violations of the Graduate Honor Code; specifically those resources at the Graduate Honor System (<http://ghs.graduateschool.vt.edu/>) and the Virginia Tech Library System's "Outline of Plagiarism and how to avoid it" (<http://www.lib.vt.edu/instruct/plagiarism/index.html>). At Wake Forest, these topics are covered in GRAD 712, 713, 714, 715, and 716.

Required Topic 2. Proper use of professional conventions in citation of existing research and scholarship, accurate reporting and ownership of findings, and acknowledgement of contributions to the work

This required topic is covered in the fourth module of the CITI on-line course entitled "Publication Practices and Responsible Authorship." In addition, as part of the BMES 5984 BME Ethics Professional Development course students will be introduced to Virginia Tech resources on proper citations of existing research, the reporting and ownership of findings and the acknowledgement of contributions of work. These resources include those resources available at the Graduate Honor System (<http://ghs.graduateschool.vt.edu/>), the "Information Appropriately" module from VT Libraries (http://info-skills.lib.vt.edu/using_info/index.html), and the "Intellectual Integrity Guidelines" available from the Virginia Tech Research Office (<http://www.research.vt.edu/intellectual-property-virginia-tech>). At Wake Forest, these topics are covered in GRAD 712, 713, 714, 715, and 716.

Required Topic 3. Ethical standards in teaching, mentoring, and professional activities

This required topic is covered in the CITI on-line course modules entitled "Conflicts of Interest and Commitment," "Mentor/Trainee Responsibilities," "Peer Review," and "Collaborative Research." In addition, as part of the BMES 5984 BME Ethics Professional Development courses students will be introduced to Virginia Tech resources on ethical standards in teaching, mentoring, and professional activities. In particular, Virginia Tech courses on training on research misconduct are provided through the Networked Learning Initiatives (<http://www.research.vt.edu/professionaldevelopment/>). The Research Office provides a general informational brochure about misconduct (<http://www.research.vt.edu/research-integrity-office/brochure/misconduct-brochure.pdf>). The "IRB Human Subjects Research Tutorial" provides information on the procedures and approval requirements for the use of human subjects in research (http://www.irb.vt.edu/pages/tutorial_intro.htm). Finally, the Virginia Tech Research Office provides conflict of interest training and resources (<http://www.research.vt.edu/conflict-ofinterest/training>). At Wake Forest, these topics are covered in GRAD 712, 713, 714, 715, and 716.

Required Topic 4. Available avenues for reporting alleged misconduct

The available avenues for SBES graduate students to report alleged misconduct will be presented at orientation, SBES 5944 BME Graduate Seminar, and BMES 5984 BME Ethics Professional Development course. The particular avenues available to students include the Graduate Honor System (<http://ghs.graduateschool.vt.edu/>) and the Committee on Faculty Ethics (<http://www.facultysenate.vt.edu/Faculty-Senate-Committees/faculty-senateethics-committee.html>). Both will be presented and described. Examples of how these resources can be used will be provided and based on situations that have previously arisen in the SBES graduate program. At Wake Forest, these topics are covered in GRAD 712, 713, 714, 715, and 716.

Beginning Fall 2021, all SBES students at the Virginia Tech campus must include one of the following on the Plan of Study for the Inclusion and Diversity Requirement:

1. ENGE 5304: Graduate Student Success in Multicultural Environments
2. GRAD 5214: Diversity in a Global Society

The ENGE 5304 course is currently approved for the College of Engineering and the GRAD 5214 course is currently approved for the Graduate School. Students in the SBES program at the Virginia Tech campus may take either one to meet the Inclusion and Diversity requirement.

Currently, there is not an Inclusion and Diversity requirement nor course offerings at the Wake Forest Graduate School for SBES students at the Wake Forest campus. Students at the Wake Forest campus are encouraged to attend Diversity, Equity, and Inclusion trainings and events held at both campuses.

Additional Program Requirements

All SBES Ph.D. students are required to participate in ethics and integrity activities as part of their graduate studies. SBES graduate students who have satisfied these requirements through the procedure proposed herein will have this fact noted in their plan of study when this plan is submitted to the Graduate School for approval.

The procedure proposed by SBES consists of the following four requirements to be made of all entering SBES graduate students. All entering SBES graduates students are required to attend an orientation session prior to the beginning of the fall semester. Attendance is taken at this orientation and will be recorded in each student's departmental record. In addition, an orientation website has been created that has a list of required safety and ethics trainings as well as forms that students at each campus must complete prior or by the end of the first semester of enrollment. This will be collected and tracked by the graduate coordinator.

Program & Graduate School Requirements at Virginia Tech:

- Chemical Safety/Lab Training – Met through Orientation
- Personal Protective Equipment Training – Met through Orientation
- Portable Fire Extinguisher Training – Met through Orientation
- Bloodborne Pathogens Training – Met through Orientation
- Title IX Training – Met through Orientation
- SBES Manual Certification – Met through Orientation
- Clinical Rotation Forms and Vaccinations/Shots (PhD only)
- ENGE 5984: Graduate Student Success in Multicultural Environments Seminar or GRAD 5214 Diversity for Global Society (VT Graduate School Diversity Requirement)
- (Starting Fall 2021) BMES 5984 BME Ethics and Professional Development course (VT Graduate School Ethics Requirement) which includes:

- Conflict of Interest Training (COI)
- Responsible Conduct of Research (RCR) Training
- VT Human Subjects Protection Training
- Ethics Training

*Additional trainings may be required by the graduate school and/or Virginia Tech

Program and Graduate School Requirements at Wake Forest:

- Clinical Rotation Forms and Vaccinations/Shots (PhD only)
- SBES Manual Certification

All entering SBES graduate students at Wake Forest University are also required to complete the following ethics courses:

1. MS students are currently only required to take GRAD 713 and GRAD 714.
2. PhD students are required to take all 4 courses. Obviously, if there is any possibility that a MS student might wish to join the PhD program one day, it would be wise to go ahead and take the 715 and 716 alongside the rest of the 1st year students.
 - GRAD 713 – Foundations of Scientific Integrity and Professionalism (1 hour)
 - GRAD 714 – Scientific Integrity and Professionalism (2 hours)
 - GRAD 715 – Career Planning in the Biomedical Sciences (1 hour)
 - GRAD 716 – Seminars in Professional Development (1 hour)

ENROLLMENT AND REGISTRATION

Enrollment and Registration (Virginia Tech Campus)

Registration / Pre-Registration

New students entering the SBES program will be registered in advance for the first semester by the Graduate Coordinator. This will occur sometime during late summer. Students will be registered into one or more required courses, with the remainder of the credit hours assigned to research. After new student orientation, changes can be made to schedules as needed (with the exception of required courses). During orientation information will be given regarding the selection of courses and how to sign up for and/or adjust research hours. After the first semester of study, students will register for classes online via Hokie SPA after consulting with their advisors.

On the Timetable of Classes all SBES faculty have individual Research & Thesis (5994) and Research & Dissertation (7994) sections designated by separate CRN (Course Registration Number) numbers. Student should sign up under their respective advisor's research section. M.S. students should sign up for a 5994 section and PhD. candidates should sign up for a 7994 section. If a student does not have an assigned advisor, they may use a generic section taught by "Staff".

Pre-registration for continuing students is an eight-day period in the middle of each semester during which currently enrolled students may select classes for the next semester. During spring semester, students can

register for summer school (if they plan to attend) and for fall semester classes. Consult the registrar's website, <http://www.registrar.vt.edu/>, for information. Pre-registration is also referred to as "course request".

NOTE: Continuing graduate students are advised to pay attention to the Bursar's billing cycle when thinking about pre-registering for courses, particularly for fall semesters, since billing for fall occurs in mid-July, making comprehensive fees due on August 10 (prior to the start of school). Graduate students can now finance their comprehensive fees, but ONLY IF their assistantship is entered into Banner. If for some reason a grad student's payroll record has not been set up by then, the full fees are due and if not paid, they will accrue a late fee. For this reason, it may be a good idea not to pre-register for fall classes, unless it is believed to be necessary in order to gain a seat.

At Virginia Tech the maximum number of semester credit hours allowed for graduate students is 18. A normal course load is from 9-12 credits per semester plus research credits to reach 12-18 credits total. If a student is on an assistantship they must carry a minimum of 12 credit hours per semester (excluding summers). Overloads (19 hours or more per semester or 6 each summer session) require permission of the graduate dean.

Approximately three weeks after the close of pre-registration week, course request results (class ticket) are available and may be printed by accessing Hokie SPA at <http://hokiespa.vt.edu/>. The Web class ticket will include detailed information regarding sections which are full, conflicting, withdrawn, or restricted, and it explains why these sections were not added to the student's schedule.

Changes in Enrollment

Students may adjust their schedules on a space available basis using Web Drop/Add (available through Hokie SPA), an electronic schedule adjustment program. The Add Period is restricted to a short period at the beginning of the semester (normally the first week of classes), the Drop Period lasts for a longer period of time into the semester; deadlines for these electronic transactions that can be done by students are published in the Course Timetable for each semester.

Force Add

A "force-add" form permits enrollment in a class over the set capacity for that course or to over-ride course restrictions. This transaction is done with the "force-add" form available in the department offering the course, and requires the instructor's (or, in some departments, departmental) permission. Force-adds are processed by the department offering the course during the Add Period in the first week of classes of each semester. SBES students wishing to force-add a BMES class must go to the office of the SBES Graduate Coordinator to obtain the necessary form for doing so. Students from other majors who wish to force-add SBES courses also need to follow this procedure.

Late Add and Drops

In unusual circumstances when adjustments to student schedules are needed after the last day to carry out an electronic change, SBES students must obtain a BMES Force-Add form from the SBES Graduate Coordinator's office, gather the necessary signatures from the instructor and the advisor, after which the form is turned in to the SBES Graduate Coordinator for processing at the Graduate School. Permission from the Graduate Dean is required for this transaction. An explanation of the extenuating circumstances necessitating the change will be required. Late withdrawals from a course which are approved are designated on the student's transcript as a

“graduate withdrawal” (WG) and do not carry a grade penalty. This option is only allowed prior to the Friday of the last week of classes for the semester.

If a student wants to Withdraw from all courses for a semester or if a student who is enrolled for a single course wishes to drop that course, a Resignation/Withdrawal form (from the Graduate School) must be submitted to the Registrar’s office by certain specific deadlines. See the VT graduate catalog for further information.

Continuous Enrollment Requirement

Unless on an approved leave of absence, graduate students in degree programs must be registered continuously during the academic year (fall and spring semesters) and pay the prescribed tuition and fees. Students working on research/scholarly activity toward their thesis or dissertation should enroll in the number of credit hours that reflects the extent of a student’s study or research. SBES students are expected to work closely with their advisors to determine the appropriate number of research credit hours that should be taken each semester.

Minimum enrollment is for 3 credit hours except in the case of a student who qualifies for Start of Semester Defense Exception (see section on Progress to the Degree). To be considered “full-time” students must be registered for 9 or more graduate hours – anything less is considered “part-time”. Students on graduate assistantships must be enrolled for a minimum of 12 credits. Normally graduate students do not enroll for courses in the summer, but if a decision to enroll during one of the summer sessions is made, a full-time load is 3 credit hours.

Student Responsibility in Enrollment

Each student is responsible for verifying their enrollment in courses and for making any changes in that enrollment. Students should check their enrollment in specific courses during the first week of classes of a semester (the Add Period) when any correction can be made electronically. Faculty cannot add or drop students from their rolls and cannot add or drop a student by including or removing their name on the final grade sheet.

Enrollment at the Time of Examination and Degree Completion

Graduate students must be registered for the minimum number of credits in the semester or summer session when they take an examination required by Graduate School Policies and in the semester when a degree is completed. Students who have been out of residence and return to work with their advisor during their thesis/dissertation writing should be enrolled for a minimum of 3 credits of research (this presumes that all other coursework on the student’s Plan of Study has been completed). Faculty advisors and committee members should not agree to work with students who are not enrolled, i.e., a student who wishes to return to defend a thesis/dissertation needs to have a period of research enrollment for working with their advisor and committee prior to the defense.

Students who have a thesis/dissertation ready for defense by the beginning of a new semester may schedule that defense within the first 15 class days of the semester and qualify for Start of Semester Defense Exception under which they only have to be registered for one (1) credit hour. Students may also register for one (1) credit if they defend their final exam during the summer as long as they were registered for at least three (3) credits the spring semester. If a student decides to defend their prelim exam during the summer session, they must be enrolled at least 3 credits during the spring semester and sign up for 3 more during the summer

semester. For a fuller discussion of Start of Semester Defense Exception (SSDE) and summer exams, see the VT Graduate Catalog's Policies section on the Graduate School's website.

Grading and Grade Requirements

All courses on the Plan of Study, i.e., courses that satisfy degree requirements, must be taken for a letter grade (A/F) except for those courses offered on a pass/fail (P/F) basis only (for example, seminars and Independent Study courses are only P/F at Virginia Tech). Courses on the Plan of Study with grades below C- (C minus) must be repeated. Courses on the Plan of Study, once taken, cannot be removed from the Plan of Study.

Graduate students are permitted to take additional courses on a pass/fail basis only if those courses are not on their Plan of Study, are outside the department, and are approved by the student's advisor. Such courses may not be used to satisfy minimum degree requirements. Once credit is received for a course taken P/F, the course may not be repeated for a regular grade.

In addition to the university standard grading scale of A-F (see Graduate Catalog), SBES graduate students can also receive grades of P/F (Pass: performance of C- or higher when enrolled for the P/F grade option), "I" (Incomplete), "X" (a temporary grade for the first semester in those courses that continue across more than one semester), NG (no grade: assigned when the student has not done any of the work for the course), NR (not reported: the instructor did not enter a grade), EQ (equivalency credit – a "pass" for research). Grades in all courses, including those not counted for graduate credit on the student's Plan of Study, are calculated into the overall GPA. An additional GPA is calculated for the coursework on the Plan of Study. Grades of "P", "I", "X", "NR" and "EQ" do not calculate into the GPA, but "F" (on a course taken Pass/Fail) and "NG" calculate as 0.0 in computing the GPA. Graduate students are expected to maintain a 3.0 overall GPA in order to be considered as making satisfactory progress and to be eligible for assistantships. See the Graduate Catalog for a thorough explanation of the grading system.

Incomplete and X Grades:

Incompletes do not calculate into the GPA and may be given when the requirements of a course have not been completed because of illness or extenuating circumstances. This judgment is made by the course instructor. Incompletes should be removed by completing the course requirements as soon as possible. SBES policy calls for the removal of an incomplete ("I") grade no later than the end of the next academic semester (not including summers). Failure to comply could result in conversion of the "incomplete" to a "F" assigned initially to course work that extends over more than one semester and are removed when the final grade for the course is entered. Graduate degrees cannot be completed until all "I", "X", "NR", and "NG" grades have been converted to a passing letter grade (C- or better for courses taken A-F, "P" for courses only offered P/F). In many cases these grades reflect unresolved problems or errors that can and should be remedied.

Auditing SBES Courses

SBES graduate students may audit courses according to the standard audit policy at Virginia Tech. An audit requires the approval of the instructor and the student's graduate advisor. Auditing of laboratory work is not permitted. Registration for audit may not be changed to credit, or vice versa, after the last day to add classes, without the signature of the instructor, student's major advisor, and the Dean of the Graduate School. Audited courses do not count toward full-time enrollment. Audited courses also may not be included towards degree requirements on the plan of study since they are not credited courses.

At the end of the course period, the instructor will determine if an audit is “satisfactory” or “unsatisfactory” based on participation and other expectations set forth at the beginning of the course period. Unsatisfactory audits will not appear on transcripts and therefore will not affect the GPA. Students will NOT be allowed to register for credit in any course previously audited.

Audit Procedures:

In order to add a BMES audit class to the schedule, SBES students, as well as students from other disciplines, must obtain a BMES Audit Request Form from the SBES Graduate Coordinator which is to be completed by the student and the course instructor. After the signatures of both are obtained, the form is submitted to the SBES Graduate Coordinator for processing at which time the requested audit is added to the student’s schedule. Any students signing up online for an AUDIT during DROP/ADD will be dropped from the course rolls. Audits will be added to classes based on seat availability.

Independent Study, Special Study & Con-joint Course Designations & Requirements

Independent study and special study courses allow students to pursue subject matter study in areas for which there are no approved formal courses. Independent study courses generally involve extensive reading and tutorial sessions with a faculty member. The subject of Independent Study is a continuation in greater depth of a topic covered in a regular course, allowing students to study topics of particular individual interest. The instructor may not be the faculty supervisor as it is expected that the faculty supervisor will provide specialized training to their students as part of the supervisor’s advising responsibilities. Students receive credit for training from their supervisor through enrollment in their Research and Dissertation/Thesis courses.

Special study courses are designed for a group of students, rather than for a single individual. This type of course may be used to study a timely topic; one in which there is current, but not lasting, interest. It also may be used as an experimental course before incorporation into the regular curriculum.

On SBES plans of study the number of credits allowed for both independent study and special study courses is subject to the following limits:

- For the M.S. program, a maximum of 6 hours of independent study courses and a maximum of 6 hours of special study courses, with the total for both independent study and special study courses of no more than 9 hours, may be used on the plan of study.
- For the Ph.D., a maximum of 6 hours of independent study courses and a maximum of 12 hours of special study courses, with the total for both independent study and special study courses of no more than 15 hours, may be used on the plan of study.

Note: The above restrictions may not always apply for SBES students because there might be cases in which students are taking several ‘new or proposed’ courses as special studies which are undergoing the university approval process and have not yet been assigned permanent numbers. In these cases, students’ plans may exceed the prescribed limits stated above and these exceptional circumstances will be conveyed to the Graduate School.

BMES 5974: Independent Study at the Graduate Level:

Independent Study at the Graduate level requires a syllabus, a title, justification, and the method of evaluation. Independent study courses are offered on a “pass/fail” basis only. The SBES Graduate Directors and the instructor must first approve the syllabi for 5974 courses. After that, the graduate coordinator will get

the approval from the department head, the dean for the student's curriculum, the dean for the department, and the dean of the graduate school for approval of the syllabi for 5974 courses.

Process:

Students do NOT register online for Independent Study courses. The decision to do an Independent Study is made between the student and the course instructor well before the start of a new semester. A form called "Request for Independent Study" is on the SBES website. This form must be completed by the instructor and the student prior to the start of the semester in which the course will be conducted, and the course description must be attached. The form is submitted to the SBES Graduate Coordinator who will obtain the signatures beyond those of the student and the instructor. Once all approve the course, the SBES Graduate Coordinator will then register the student for the course.

This procedure is to be done no later than two weeks prior to the start of the semester during which the class will be held in order to provide sufficient time for processing.

BMES 5984/6984: Special Study at the Graduate Level

Requires a syllabus and method of evaluation. Credits may be used for meeting degree requirements. Special studies are most often used when new courses are being tested and/or are going through the university approval process. These courses must be approved by the department head and the college before being submitted to the Graduate School.

Con-joint Courses

On the Virginia Tech campus prior to fall 2009, there was a category of 4000-level (senior) courses which were also "approved for graduate credit" and these courses were allowed on graduate plans of study. As of fall 2009, the Graduate School eliminated this course category, and in its place a system was implemented whereby senior-level courses considered advanced enough for graduate credit would be offered at BOTH levels, and would be listed separately on the Timetable with individual CRN numbers. Any course listed with a 4000-level number and also a 5000-level (graduate) number is referred to as a "con-joint" class.

In such cases SBES policy requires students to sign up for the 5000-level section of the course – not the 4000-level section. In addition to the 5000-level number, some departments may also change the title by adding the word "Advanced" to the course title. Others may list the 5000- number with the letter "G" following it. 4000-level courses are not allowed on SBES plans of study.

Enrollment and Registration (Wake Forest Campus)

Registration/Pre-registration

New students entering the SBES program on the WFU campus are assigned required training modules in HealthStream as part of the on-boarding process. The Academic Procedures Module has information about how to register for classes using the Student Center in PeopleSoft. If you have any questions on the course registration system or how to use it please reach out to Susan Pierce, spierce@wakehealth.edu. Courses will be chosen with the help of faculty advisors. Normally new students will enroll in Quantitative Cell Physiology, an SBES required course for both MS and PhD candidates which is only offered in the fall semester. Advisors assist with the addition of other courses including research hours to create a full-time credit load. Students may enroll for up to 13 research credits in the fall and spring semesters, and 6 research credits in the summer.

At WF, the maximum number of semester credit hours allowed for graduate students is 18. A normal course load is from 9-12 credits per semester plus research credits to reach 12-18 credits total. If a student is on an assistantship they must carry a minimum of 12 credit hours per semester (excluding summers). Overloads (19 hours or more per semester or 6 each summer session) require permission of the graduate dean.

Continuing students are notified via e-mail by the Graduate School office that registration is available. Registration is completed on-line using the Student Center in PeopleSoft. Students with outstanding university debt (i.e. - unpaid health insurance premiums or thesis only fees) will not be allowed to register until those charges are paid in full. New students who have not fulfilled the health and vaccination history and TB testing through Employee Health within 30 days following enrollment will not be allowed to attend classes until their immunizations are documented. If your address and/or phone number has changed, please update that information in the student center.

Changes in Enrollment

There is an official registration period for each semester (including the summer session), which can be found on the Graduate School Calendar. For a short period of time at the beginning of the semester students may request that changes be made to their schedules with the approval of their advisors and course instructors. Students are advised to pay attention to the deadline dates around dropping and adding classes. Changes to schedules are made on-line in the Student Center.

Adding or Dropping a Course

With the approval of the advisor and instructor, a student may add a course during the first two weeks of classes or the equivalent period during a summer term. With the same approval, a student may drop a course during the first month of a semester or the equivalent period during a summer term without penalty or notation on the transcript. A student who is permitted to drop a course after the first month, with the approval of the dean of the Graduate School and the department concerned, is assigned a Drop (DRP). Courses marked Drop are not counted in determining the grade point average. The Add/Drop form may be accessed on the Graduate School website.

Withdrawing from Classes

Students who wish to withdraw from the Graduate School must complete the appropriate form, which requires approval from the department concerned and the dean of the Graduate School. Students who leave without following this procedure shall receive a grade of For U in each course in progress. Students who withdraw by the drop date, established by the academic calendar, of the semester will not have a grade recorded for courses in progress. Students who withdraw after the drop deadline shall be assigned a grade of Withdraw-Passing or Withdraw-Failing for each course in progress. The Withdraw form may be accessed on the Graduate School website.

Continuous Enrollment

Degree-seeking students must have continuous enrollment through the semester in which they graduate. Enrollment may be achieved by registering for courses, including research, or by registering as "thesis only". To be considered full-time, a student must be registered for nine credit hours in the fall and spring semester and six credit hours for a summer session. This is especially important for international students who must be

enrolled full-time (9 hours) to maintain their visa status. Students registered as “thesis only” are considered full-time.

Grading and Grade Requirements

Records of progress are kept by the institution on all students enrolled. Grade reports are furnished to students at the end of each semester or summer term. In addition to the university standard grading scale of A-C, then F (see the WFU Graduate Bulletin), SBES graduate students can also receive grades of “I” (Incomplete), AUD (Audit), DRP (Official drop), NC (no credit), NR (grade not reported), WD (Withdrew), WP (Withdrew Passing), WF (Withdrew Failing), S (Satisfactory), U (Unsatisfactory), and RPT.

A student whose cumulative grade point average (GPA) falls below 2.5 may be placed on academic probation. The student will have one semester to bring their GPA to 2.5 or greater; otherwise, the student may be dismissed from the Graduate School by the dean. The grade point average is obtained by dividing the total number of grade points earned by the total number of hours attempted for a grade, including hours for courses in which the grade is “F”. Grades of “S” (Satisfactory) or “U” (Unsatisfactory) do not enter into the GPA.

Individual departments or programs may require a higher-grade point average than 2.5 for continuation. If there is such a requirement, it is stated in the departmental or program policies. In the School of Biomedical Engineering & Sciences, the required minimum grade point average is 3.0. A student may be dismissed from the Graduate School by the dean upon recommendation of their department or program if he or she does not make adequate progress in research. Adequate progress is determined by the standards of the department or program in which the student is enrolled. The minimum grade point average required for graduation is 3.0. Ph.D. candidates must have a grade point average of 3.0 in graduate courses at the time of the preliminary examination.

Incomplete and Unreported Grades

The grade of “I” (Incomplete) may be assigned only when a student fails to complete the work of a course because of illness or some other emergency. If the work recorded as “I” is not completed within thirty days after the student enters for their next semester, not counting the summer sessions, the grade automatically becomes “F”. The instructor must report the final grade to the registrar within forty-five days after the beginning of that semester.

The grade of “NR” (Not reported) must be resolved within forty-five days after the beginning of the next semester or the grade automatically becomes an “I”. No degree will be granted with an NR or I on a student’s record.

Auditing SBES Courses

SBES graduate students may audit courses according to the standard audit policy at Virginia Tech. An audit requires the approval of the instructor and the student’s graduate advisor. Auditing of laboratory work is not permitted. Registration for audit may not be changed to credit, or vice versa, after the last day to add classes, without the signature of the instructor, student’s major advisor, and the Dean of the Graduate School. Audited courses do not count toward full-time enrollment.

At the end of the course period, the instructor will determine if an audit is “satisfactory” or “unsatisfactory” based on participation and other expectations set forth at the beginning of the course period. Unsatisfactory

audits will not appear on transcripts and therefore will not affect the GPA. Students will NOT be allowed to register for credit in any course previously audited.

Audit Procedure

In order to add a BMES audit class to the schedule, SBES students must obtain a BMES Audit Request Form from the SBES Graduate Coordinator which is to be completed by the student and the course instructor. After the signatures of both are obtained, the form is submitted to the SBES Graduate Coordinator for processing at which time the requested audit is added to the student's schedule. Any students signing up online for an AUDIT during DROP/ADD will be dropped from the course rolls. Audits will be added to classes based on seat availability.

Independent and Special Study Courses

Independent study and special study courses allow students to pursue subject matter study in areas for which there are no approved formal courses. Independent study courses generally involve extensive reading and tutorial sessions with a faculty member. The subject of Independent Study is a continuation in greater depth of a topic covered in a regular course, allowing students to study topics of particular individual interest. The instructor may not be the faculty supervisor as it is expected that the faculty supervisor will provide specialized training to their students as part of the supervisor's advising responsibilities. Students receive credit for training from their supervisor through enrollment in their Research and Dissertation/Thesis courses.

Special study courses are designed for a group of students, rather than for a single individual. This type of course may be used to study a timely topic; one in which there is current, but not lasting, interest. It also may be used as an experimental course before incorporation into the regular curriculum.

On SBES plans of study the number of credits allowed for both independent study and special study courses is subject to the following limits:

- For the M.S. program, a maximum of 6 hours of independent study courses and a maximum of 6 hours of special study courses, with the total for both independent study and special study courses of no more than 9 hours, may be used on the plan of study.
- For the Ph.D., a maximum of 6 hours of independent study courses and a maximum of 12 hours of special study courses, with the total for both independent study and special study courses of no more than 15 hours, may be used on the plan of study.

Note: The above restrictions may not always apply for SBES students because there might be cases in which students are taking several 'new or proposed' courses as special studies which are undergoing the university approval process and have not yet been assigned permanent numbers. In these cases, students' plans may exceed the prescribed limits stated above and these exceptional circumstances will be conveyed to the Graduate School.

BMES 697: Independent Study at the Graduate Level

WFU SBES students register for an independent study like they would any other class.

Independent Study at the Graduate level requires a syllabus, a title, justification, and the method of evaluation. Independent study courses are offered on a "pass/fail" basis only. The SBES Graduate Directors and the instructor must first approve the syllabi for 697 courses. After that, the graduate coordinator will get

the approval from the department head, the dean for the student's curriculum, the dean for the department, and the dean of the graduate school for approval of the syllabi for 697 courses.

Process:

Students do NOT register online for Independent Study courses. The decision to do an Independent Study is made between the student and the course instructor well before the start of a new semester. A form called "Request for Independent Study" is on the SBES website. This form must be completed by the instructor and the student prior to the start of the semester in which the course will be conducted, and the course description must be attached. The form is submitted to the SBES Graduate Coordinator who will obtain the signatures beyond those of the student and the instructor. Once all approve the course, the SBES Graduate Coordinator will then register the student for the course.

This procedure is to be done no later than two weeks prior to the start of the semester during which the class will be held in order to provide sufficient time for processing.

BMES 698: Special Study

Special studies at Wake Forest are handled under the same regulations as all other courses. They carry 3 credits and are usually used to launch a new course.

PROGRAM CHANGES

Change of Campus Location

Virginia Tech Students moving to Wake Forest

Because of the joint nature of the SBES program, it is occasionally advantageous for a student who starts off at one campus location to transfer or move to the other campus. This usually occurs when it is determined that the student's research would be better served by relocating to the opposite campus.

The VT Graduate School requires that a student submit a "Change of Campus" form which can be found on their website. This form must be completed and signed by the SBES representative at the student's current campus location. Note that the form does not offer "Wake Forest" as a campus choice, so it must be written in by hand.

Once the form is signed by the student and the SBES representative, it must be submitted to the SBES Graduate Coordinator's office for processing after which it is sent to the Graduate School. International students wishing to change campuses must check with the immigration personnel at both Graduate School locations (VT and WFU) for information regarding visa changes, etc.

Wake Forest Students moving to Virginia Tech

Because of the collaborative nature of the SBES program, a circumstance may arise in which a student on the WFU campus would benefit from actually transferring to the Virginia Tech campus. Should this change be desired, the process is as follows:

- 1) The student submits a request in writing that a change of campus be made.
- 2) The faculty advisor (and/or committee) submits a letter supporting this request, and proposes a timeline (semester effective) for the change to take place.

- 3) Both letters are submitted to the graduate school for the Dean's approval.
- 4) Upon approval the student would be officially terminated at WFU and a Virginia Tech Change of Campus form would be completed at Blacksburg for the VT graduate school's approval.

Change of Status

Virginia Tech Student Status Change

Students may apply to the SBES program as MS students and later switch to a PhD or they may finish their MS degree and decide to stay for a PhD degree. The following steps must be done regardless of the situation for students wishing to switch from MS to PhD:

- 1) Submit a letter from the advisor recommending you to the PhD program.
- 2) Submit an updated transcript from your graduate studies within the MS degree.
- 3) Submit the "Request to Change Degree" form (provided by the graduate coordinator)
- 4) Submit a 1 paragraph personal statement or justification on why you want to switch to or begin the PhD degree.

Once the packet of information has been sent to the graduate coordinator, the graduate coordinator will send it to the graduate committee to review the packet of info and make the final vote before making the recommendation to each of the graduate schools.

The student will be notified of the recommendation once the committee has voted. The graduate schools at each campus will be given the necessary information needed for making the change. The packet will also go in the student's official record in SBES.

PhD students may opt to drop down to a M.S. degree only for various reasons. Students who wish to do this should see the graduate coordinator for the VT Change of Degree form (regardless of campus). Students at the Wake Forest campus will also need to work with their graduate school on additional requirements.

Wake Forest Student Status Change

Students may apply to the SBES program as MS students and later switch to a PhD or they may finish their MS degree and decide to stay for a PhD degree. The following steps must be done regardless of the situation for students wishing to switch from MS to PhD:

- 1) Submit a letter from the advisor recommending you to the PhD program.
- 2) Submit an updated transcript from your graduate studies within the MS degree.
- 3) Submit the "Request to Change Degree" form (provided by the graduate coordinator)
- 4) Submit a 1 paragraph personal statement or justification on why you want to switch to or begin the PhD degree.

PLEASE NOTE:

- Wake Forest students going from a MS to a PhD at Wake Forest must also apply through CollegeNet with just the demographic information. See the WF Graduate School for help.
- Wake Forest students going from a MS at Wake Forest to a PhD at Virginia Tech do not have to submit this extra application.
- Virginia Tech students going from a MS at Virginia Tech to a PhD at Wake Forest will have to do this extra step.

Once the packet of information has been sent to the graduate coordinator, the graduate coordinator will send it to the graduate committee to review the packet of info and make the final vote before making the recommendation to each of the graduate schools.

The student will be notified of the recommendation once the committee has voted. The graduate schools at each campus will be given the necessary information needed for making the change. The packet will also go in the student's official record in SBES.

PhD students may opt to drop down to a M.S. degree only for various reasons. Students who wish to do this should see the graduate coordinator for the VT Change of Degree form (regardless of campus). Students at the Wake Forest campus will also need to work with their graduate school on additional requirements.

ADDITIONAL SBES POLICIES (Both Campuses)

NON-TRADITIONAL STUDENT EXPECTATIONS AND RESPONSIBILITIES

Although the majority of students enrolled in the SBES graduate program are considered traditional students (i.e., full-time students living on or in close proximity to either the VT or WFU campus), there are occasionally non-traditional students enrolled in the SBES graduate program. For the purposes of this document, non-traditional students are defined as part-time students with or without full/part-time external employment and/or students (part-time or full-time) that do not live close enough to either the VT or WFU campus to regularly attend in-person activities.

It is important to note that the SBES graduate program does not currently offer degrees that can be obtained entirely through remote/online activities. There are minimum residency requirements, required in-person activities, and program time limits that must be met in order to fulfill the degree requirements. However, in rare instances a student may need to leave the VT or WFU campus or switch to part-time student status due to extenuating circumstances (e.g., marriage, child birth, family illness, change in employer's policy for allowing/supporting an advanced degree while employed, etc.) after starting the graduate (i.e., MS or PhD) program as a full-time student. This would result in the student's classification changing from being a traditional student to being a non-traditional student.

Although it is possible to complete the degree requirements after switching to a non-traditional student status, it does present certain challenges in regard to residency requirements, program completion time limits, program activities, coursework, and research. The following describes some of the challenges, as well as the respective expectations and responsibilities of the non-traditional student.

SBES Program Time Limits: All SBES graduate students must complete their degree in a timely manner. See "SBES Program Limits" sub-section in the "PROGRESS TO THE DEGREE" section.

Residency Requirements: All SBES graduate students must meet the residency requirements for the SBES university campus in which they are enrolled. The general expectation is that these requirements will be met during the first year of enrollment for VT students and during the first three years of enrollment for WFU students. See "Residency Requirements" section.

Courses and Program Activities: Given that the SBES program is a joint program between VT and WFU, SBES students may participate in a variety of courses that are in-person, hybrid, and/or fully virtual. Consequently,

not all SBES, VT, or WFU courses are offered via a format that permits distance learning, but rather some require in-person attendance. This can limit the course options available to SBES students and their ability to meet the coursework requirements for a given degree. The following describes the expectations and responsibilities of all SBES students for different types of course offerings and required SBES graduate program activities.

Required SBES Program Activities and Courses

- Required Virtual Courses with In-Person Components: There are required SBES courses for which live, synchronous lectures are broadcast virtually between the VT and WFU campuses.
 - *Expectations:*
 - All SBES graduate students must complete all of the required courses to graduate.
 - Requests to substitute courses offered by outside institutions will not be considered.
 - These courses are normally taken during the first year of program, which typically overlaps with the residency requirement.
 - Requests for remote accommodations can be made. However, the decision to provide accommodations is entirely at the discretion of the faculty member(s) primarily responsible for teaching the course.
 - *Student Responsibilities:*
 - If remote accommodations are desired, it is the responsibility of the student to make the request and arrangements with the faculty member(s) primarily responsible for teaching the course.
 - If remote accommodations are granted, the student may still be required to attend in-person on essential days (e.g., exams, project presentations, etc.), at the discretion of the instructor(s). Given the limited resources of the program, the student must make the necessary arrangements (e.g., time off from work, travel arrangements, etc.) to attend required, in-person components.
- Required In-Person Courses and Activities: There are required SBES graduate program activities and courses that require in-person attendance (e.g., Clinical Rotations- PhD only, SBES Student Research Symposium, etc.) to meet the degree requirements.
 - *Expectations:*
 - All SBES graduate students must complete all of the required in-person courses and activities to graduate.
 - Clinical Rotations are normally completed during the first year of PhD program, which typically overlaps with the residency requirement.
 - All SBES graduate students must attend and present an oral presentation at the SBES Student Research Symposium at least once per degree. Oral presentations generally occur during the final year of a student's graduate studies.
 - Requests for remote accommodations will not be considered for these courses/activities.
 - Requests to substitute activities/courses offered by outside institutions will not be considered.
 - *Student Responsibilities:*
 - Given the limited resources of the program, it is the responsibility of the student to make the necessary arrangements to attend all required in-person activities and courses.

Non-Required Courses Offered by SBES and Other Departments

- Virtual Courses Offered by SBES and Other Departments: There are some non-required courses (e.g., Life Science, Math, and Engineering Elective Courses) offered by SBES and other departments at VT or WFU that are taught virtually.

- *Expectations:*
 - If a given class is taught entirely online, then there should be no issues with taking the class remotely. However, synchronous lecture attendance may be required, at the discretion of the instructor(s).
 - If a given class requires in-person components or requires synchronous lecture attendance, then requests for remote accommodations can be made. However, the decision to provide accommodations is entirely at the discretion of the faculty member(s) primarily responsible for teaching the course.
- *Student Responsibilities:*
 - If remote accommodations are desired, it is the responsibility of the student to make the request and arrangements with the faculty member teaching the course.
 - If remote accommodations are granted, the student may still be required to attend in-person on essential days (e.g., exams, project presentations, etc.), at the discretion of the instructor(s). Given the limited resources of the program, it is the responsibility of the student to make the necessary arrangements to attend required, in-person components for these courses.
 - If remote accommodations are not granted, it is the responsibility of the student to make the necessary arrangements to attend required synchronous or in-person components of these courses.
- **In-Person Courses Offered by SBES:** Some non-required courses (e.g., Life Science, Math, and Engineering Elective Courses) offered by SBES are NOT taught virtually (i.e., in-person only).
 - *Expectations:*
 - Remote accommodations are not typically made available for these courses.
 - *Student Responsibilities:*
 - It is the responsibility of the student to make the necessary arrangements to attend the in-person components for these courses.
- **In-Person Courses Offered by Other Departments:** A number of non-required courses (e.g., Life Science, Math, and Engineering Elective Courses) offered by other departments at VT or WFU are NOT taught in virtual format (i.e., in-person only). Remote accommodations will not be made for these courses.

Graduate Research: Performing graduate research for a thesis or dissertation is an essential component of the graduate degrees currently offered by the SBES graduate program. All SBES graduate students are expected to perform their graduate research on campus or in an off-campus VT or WFU laboratory. However, the SBES Program Directors and faculty advisor(s) may allow remote graduate research at their discretion. Conducting graduate research as a non-traditional student presents a number of challenges. The following describes the challenges, expectations, and responsibilities of a non-traditional student for completing the graduate research required to earn a degree.

Challenges

- Differences in Physical Location
 - Not all types of graduate research can be performed remotely, but rather requires the student to physically be on campus or in an off-campus VT or WFU laboratory. This can limit the ability of non-traditional students located in a different physical location to not only complete their research, but to do so in a timely manner.
- Part-Time Students with/without Full/Part-Time External Employment
 - Typically, graduate research requires a substantial amount of time and effort to complete. Not all types of graduate research can be conducted sporadically, but rather requires numerous consecutive days,

weeks, months, or years of continuous work. This can limit the ability of part-time students to not only complete their research, but to do so in a timely manner.

Expectations:

- Residency requirements must be met (See Residency Requirements)
- Research and final defense must be completed in a timely manner (See SBES Program Time Limits)
- Research that requires the student to physically be on campus or in an off-campus VT or WFU laboratory must be performed in that respective location
- Work that is already required to be performed as part of external employment should not be the basis of a student's graduate research. In cases where an external employer sponsors an employee's graduate research, it is possible that the student's graduate research is related to the nature of their external employment. However, there should be a clear distinction/delineation between the graduate research performed by the student and the student's existing responsibilities as terms of their external employment. Consequently, conflict of interest management, discretion, and an agreement between the student, advisor(s), MS/PhD committee, and employer is imperative in these cases. Ultimately, the outcome of the research and its fitness/acceptability for a degree is at the sole discretion of the student's MS/PhD committee and not the employer.
- The normal evaluation process must be conducted by the student's MS/PhD committee (i.e., plan of study, preliminary proposal for the dissertation (if applicable), thesis/dissertation, and final defense).

Student Responsibilities: It is the responsibility of the non-traditional student to:

- Make the necessary arrangements (e.g., time off work, travel arrangements, etc.) to meet the residency requirement, conduct research on campus or off-campus, coordinate research activities with advisor(s), and complete the research in a timely manner
- Work with their employer, advisor(s), and MS/PhD committee to ensure that there is a clear distinction/delineation between the graduate research and work performed as part of external employment
- Work with their advisor(s) and MS/PhD committee to ensure the outcome of the research is free of bias/external influence and meets expectations in terms of its fitness/acceptability for a degree
- Work with their advisor(s), MS/PhD committee, and other SBES faculty/staff to ensure that the normal evaluation/review process is completed in a timely manner

DRESS CODE POLICY

The dress code is applicable to all SBES students while on the WFBMC campus who will have patient or clinical contact. We must follow the same rules in these cases as physicians and staff. Patients expect to be treated with respect and to encounter a professional environment when they come to the Medical Center. Everyone must wear professional dress when they are in clinical areas (this applies to VT campus students when they are visiting the WFBMC campus).

Professional dress is defined as neat and clean slacks, dresses / skirts and shirt. Clean lab coats are also acceptable; however, dresses/skirts or slacks must be longer than the lab coat. DO NOT wear shorts underneath your lab coat. Lab coats are available from the bookstore and can be embroidered with the department name. Embroidered lab coats must use the BME standard for lettering and color (see the BME Administrative Assistant for this information). An alternative is to wear blue scrubs in the clinical areas. Students are responsible for keeping lab coats and scrubs clean. If you have questions about the dress code, see the Graduate Program Director.

Note: This policy should be used at both Virginia Tech AND Wake Forest University.

VACATION & HOLIDAY POLICY

The following describes the default vacation policy for students in SBES. Individual labs may have their own policies that supersede this one; students should check with their advisor. In all cases, students should seek advance approval from their advisor before using a vacation day.

Default Policy:

Graduate students are allowed 20 vacation days each calendar year, which include any university designated holidays. Always check with your advisor to see if they have a different vacation policy which may supersede the default policy.

Suggested procedures for requesting vacation:

Students are expected to consult their advisors when they wish to take time off from working in the lab. As a courtesy this should be discussed within a time frame that allows for planning on the part of both parties. For example, if a student wishes to take less than one week, arrangements should be made at least three (3) working days in advance. If a longer period of time is desired (i.e. 1-2 weeks), arrangements should be discussed and approved at least one month in advance. Each campus may have its own paperwork requirement, if any.

Holidays:

Graduate students are not required to work when the university is officially closed, such as on a holiday, or weather-related closing, unless they are designated by their advisor as essential personnel for lab operations.

SBES INCLEMENT WEATHER/CLASS CANCELLATION POLICY

SBES Cancellation policy and procedures for video-broadcast classes

APPLIES TO: All SBES Faculty, Staff, and Students

- If the campus from which the video-broadcast originates is closed, classes are cancelled for all students.
- If the campus from which the video-broadcast originates is open (regardless of a closing at the other campus), classes are held as scheduled.

Campus Closing Notifications:

Wake Forest Campus:

The Medical School campus does close for inclement weather and follows the main Wake Forest schedule for closings and delays.

For information on WFU emergency alerts, visit: <https://wakeready.wfu.edu/alert-methods/>

Virginia Tech Campus:

The official sources for announcing authorized closings are:

- University Home Page News, <http://www.vt.edu>
- Inclement Weather Hot Line at (540) 231-6668
- University Operator at (540) 231-6000
- WVTF-FM Radio 89.1 or 91.9 on radio dial
- <https://www.alerts.vt.edu/> Sign up for VT Alerts using your VT PID!

INSTRUCTORS: (Campus Open / Instructor Not Reporting)

If the originating campus is open and the instructor opts not to report to campus due to inclement weather or other reasons, it is the instructor's responsibility to make the following notifications:

- Notify their students through Canvas and the SBES Administrative staff at both campuses via email. The instructor should schedule a make-up session with students if necessary.

STUDENTS:

- If students have not received a notification regarding class closings, they should contact the instructors at either campus for confirmation.
- Students will not be penalized if either university closes; however, students are responsible for making up missed lectures per the instructor's policy.

EXAM FOOD AND DRINK POLICY

There is NO EXPECTATION to bring food and/or drink to committee members and attendees for any SBES exam. This includes the Preliminary Examination and Final MS/PhD Examinations. Please note, no food or drink should be brought to the Qualifier Examination Committee. Exams should focus on academic merit alone. <http://www.insidehighered.com/news/2019/08/14/phd-students-resent-expectation-they-bring-food-and-drinks-their-thesis-defenses>

STUDENT CODE OF CONDUCT

The Graduate Schools at Virginia Tech and Wake Forest University expect good citizenship and responsible behavior from SBES graduate students. When these expectations are not met, the non-academic misconduct process may be used to redirect students into more acceptable patterns of behavior. This process encourages students to take responsibility for their choices and actions, while also allowing the program to determine an appropriate disciplinary response.

Misconduct cases may result in the sanction of a formal reprimand and the imposition of an educational condition, or a more severe level of sanction, including disciplinary probation, suspension or expulsion. Students need to be aware that certain types of behaviors may be deemed incompatible with membership in the School's community, and that choices they make can compromise their education and future.

The list below, while not exhaustive, includes examples of the types of prohibited conduct for which students are subject to disciplinary actions:

- a. Actual or threatened physical injury to any person (including self) on University owned or controlled property or at a University-sponsored or supervised function, or conduct that endangers the health or safety of a person.
- b. Engaging in individual or group conduct that is violent (including sexual misconduct, attempted suicide, or threats of either), abusive, indecent, unreasonably loud, or similar disorderly conduct that infringes upon the privacy, rights, or privileges of others.
- c. Disturbing the peace or the orderly process of education on campus. This provision should not be interpreted to abridge the free speech rights guaranteed under the United States Constitution.
- d. Unauthorized use, possession, or storage of any weapon or explosive (including fireworks) on University premises or at University sponsored activities.
- e. Forgery, counterfeiting, alteration, or misuse of any University record, document, or identification card.

- f. Unauthorized entry into, or alteration of, any University computer records, or violation of computer use policies, including illegal use of University computer resources.
- g. Sending threatening, obscene or defamatory messages to another student or individual via e-mail, phone, voice-mail or social media.
- h. Knowingly filing a false report to any University authority: including police, human resources, student grievance, honor code or non-academic honor code bodies.
- i. Misrepresentation in seeking financial aid or University benefits.
- j. Unlawful possession, use, distribution, or sale of any illegal narcotic or illegal dangerous drug.
- k. Theft of, or unwarranted damage to, University property or property of any member of the University community.
- l. Failure to comply with the lawful directives of University employees or non-University contract employees acting within the scope of their duties; including those directives issued by a University administrator, police or security officer to ensure the safety and well-being of students.
- m. Entry into, or use of, any building, facility, or room or other University property or grounds without authorized approval. This also includes the unauthorized possession or use of University keys, lock combinations, or other access codes.
- n. Participation in illegal gambling activities on University-owned or -controlled property or at a function identified with the University.
- o. Possession or consumption of alcoholic beverages in contradiction of state law and/or University policy.
- p. Entering or attempting to enter any event without proper credentials for admission (e.g., ticket, identification card, or invitation).
- q. Failure to make satisfactory settlement for any debts to the University.
- r. Failure to comply with University traffic rules and regulations.
- s. Plagiarism in their academic work.

The Graduate Schools at Virginia Tech and Wake Forest University have the authority to hold students accountable under this Code of Conduct for certain off-campus behaviors (i.e., behavior that does not occur on University premises or in the context of a University, School, or student organization sponsored event or activity) that adversely affects a substantial University or School interest. In determining whether the conduct adversely affects a substantial University or School interest, the following shall be considered:

- a. Whether the conduct constitutes or would constitute a serious criminal offense, regardless of the existence of any criminal proceedings.
- b. Whether the conduct indicates that the student presented or may present a danger or threat to the health, safety or wellbeing of themselves or others.
- c. Whether the conduct demonstrates a pattern of behavior that impairs the University's, the School's or the Program's ability to fulfill its mission or negatively impacts the learning environment.
- d. Whether the conduct is disruptive to the ability of faculty to carry out the academic mission of the university.

The disciplinary sanctions that may be imposed for violations of this Code of Conduct may include any of the following actions:

- (a) A written reprimand.
- (b) Denial of specified University privileges.
- (c) Payment of restitution.
- (d) Educational or service sanctions, including community service.

- (e) Disciplinary probation.
- (f) Imposition of reasonable terms and conditions on continued student status.
- (g) Removal from a course in progress, or temporary or permanent removal from campus, including public areas.
- (h) Enrollment restrictions on a course or program.
- (i) Suspension.
- (j) Dismissal.

Students that are accused of performing, or contributing to, allegations of misconduct will be subject to a review process that will include a review of the allegation, a hearing before a committee of the student's peers and faculty, and potential disciplinary action. These procedures will be undertaken by the Program and/or Graduate School Honor Council. However, in deciding each case, the Honor Council will use the guidelines of this document to determine if there was a violation of the institution's Code of Conduct as opposed to the Honor Code. The Honor Council will make a final and formal recommendation to the Dean. As outlined in the Honor Code guidelines, the student may appeal the decision to the Graduate Council within 10 days of the sanction hearing. The Graduate Council will review all pertinent information and make a recommendation to the Dean, who will consider the recommendations by the Honor Council and the Graduate Council, in the event of an appeal. The Dean will consider all recommendations, and may accept the sanction recommendation, but has the discretion to alter the recommendation as desired. The decision of the Dean is final.

Virginia Tech Code of Conduct: <https://graduateschool.vt.edu/academics/expectations.html>

Wake Forest University Code of Conduct: <https://studentconduct.wfu.edu/undergraduate-student-handbook/>

GRIEVANCE PROCEDURES

Students wishing to pursue or file an academic or non-academic grievance should contact their home campus graduate program director. The procedure for filing a grievance varies by campus. For Wake Forest students, further details on how to file either grievance type can be found in the graduate bulletin in the "Academic and Coursework Practices" section. For Virginia Tech students please reach out to the Graduate Coordinator as well as the Virginia Tech Graduate School Ombudsperson.

HONOR CODE

All SBES graduate students are expected to become familiar with and adhere to the University Honor Codes of the campus on which they reside. Both campus honor systems maintain that the codes establish and govern academic integrity among graduate students, and they require honesty and ethical behavior in all academic pursuits. Ethical behavior is defined as conforming to accepted professional standards of conduct as codes of ethics used by professional societies in the U.S. to regulate the manner in which their professions are practiced.

SBES TERMINATION POLICY (Both Campuses)

SBES graduate students may have their graduate assistantship, tuition or fellowship terminated for several reasons including the following:

- Lying

- Cheating
- Stealing
- Data falsification
- Plagiarism
- Violations of the Virginia Tech “Principles of Community”

Termination of graduate assistantships funded by contract or grant will be at the prerogative of the faculty adviser. Termination of graduate assistantships or fellowships administered by SBES will be at the prerogative of the Graduate Program Committee.

Special Accommodations Policy

SBES students should work with the Services for Students with Disabilities at their home campus for most accommodations. Additional accommodation requests can be made to the Graduate Program Directors and reviewed on a case by case basis.

SBES Student Representation Policy

Students may undertake service roles with the understanding that no service role should interfere with their primary responsibilities as a student, or satisfactory academic progress toward their degree. SBES students are eligible to apply for and serve as a representative for departmental and program committees, where student representation is available. Students must be in good academic standing and have the support from their advisors to be a student representative. Students are discouraged from running or serving in a student representative position if they are unable to fully commit to the position duties. This may include, but is not limited to, students on medical leave or away at an internship. Students may not run for a representative position if they are actively involved in a student conduct case. This may include, but is not limited to, students who are on academic probation, academic suspension, expulsion, or involved in a student conduct, honor code, ethics, or title IX type hearing. Furthermore, in the event that a student’s status is changed during their representation time, they may request a temporary replacement until the situation is resolved or may wish to step down from the position. This is to ensure the students in these situations have the best advantage possible for handling their situation without distraction.

GRADUATE STUDENT FINANCIAL SUPPORT

Financial Support for Graduate Students (Both Campuses)

Routinely all graduate applications are evaluated for financial aid possibilities as they are being assessed for admittance into the program. Common types of financial aid available at the graduate level consist of assistantships (GRA, GTA, GA), fellowships, scholarships, and the like. Generally financial aid offers go to Ph.D. applicants, although upon occasion an exception is made and an assistantship will be offered to an M.S. candidate. Offers of admission to the program are normally accompanied by a financial aid offer (either simultaneously or separately), but admission offers can be made without an offer of employment. Financial offers can originate from the department itself, from the WFU graduate school, from special programs, or from an individual faculty member affiliated with SBES. SBES applicants/students have several different sources of financial aid available to them depending on the campus to which they apply and are accepted.

Continuation & Contingencies (Both Campuses)

Continuation of graduate student financial support (assistantship appointment, departmental fellowship, tuition scholarship) is subject to several important contingencies. The first is academic, as stated above

(section 8.1(a). Students are evaluated by their faculty advisors and if the academic performance is not satisfactory, it is possible for the student to lose the financial support. This holds for ALL aspects of a graduate student's progress toward the degree, not merely GPA requirements.

Students are also evaluated on other parameters which indicate whether or not the student is making adequate or satisfactory progress toward the degree. Unsatisfactory or deficient research progress could result in a loss of continued financial support at the discretion of the hiring faculty and/or department.

Graduate Student Funding at Virginia Tech

Graduate Assistantships (VT campus)

At Virginia Tech students are most commonly offered graduate assistantships in which the student is working for a specific faculty member or for the department under a formal contract. There are three types: GA (graduate assistantship), GTA (graduate teaching assistantship), and GRA (graduate research assistantship). Typically, GRAs are more commonly awarded in SBES than GTAs. However, any SBES student who is placed on a GTA appointment is required to be enrolled in and attend the GTA Workshop (GRAD 5004, 1 credit, P/F) in the first fall semester of the teaching appointment. The workshop consists of three half days during orientation week and two sessions from Phase II offered during fall semester.

The assistantship pays a monthly stipend as well as tuition at the in-state rate and technology, library and engineering fees. Students are responsible for paying their own comprehensive fees. Graduate assistants are expected to work 20 hours a week to be considered as having a 100% (full-time) appointment. They also are required to carry at least 12 credit hours during the fall and spring semesters. They are not required to be registered for credit hours during the summers unless they are taking a preliminary or final examination. Audited courses do not qualify in satisfying the minimum of 12 hours.

For information regarding taxes on assistantships and scholarships, please consult the Virginia Tech Graduate School website: <http://gss.graduateschool.vt.edu/financial/taxes> .

Eligibility (VT campus)

Students are evaluated by their faculty supervisors and if the work performance is not satisfactory, it is possible for the student to lose the assistantship appointment. The Graduate School requires that all students on assistantships maintain a 3.0 or better GPA (QCA) on all courses taken as a graduate student, regardless of whether or not the courses are listed on the plan of study. If the GPA drops below 3.0, the student could possibly lose the assistantship. The academic department or the Graduate School may allow a student one semester on probationary status to remedy grade deficiencies while holding an assistantship.

Graduate assistants must be able to meet the requirements to be eligible for employment in the United States, and they must demonstrate that they are making satisfactory progress toward the intended graduate degree. Failure to do so could result in loss of the assistantship appointment.

Residency: In-state vs. Out-of-state (VT campus)

If you are an out-of-state student on an assistantship you may receive a tuition scholarship and out-of-state fee waiver, but your out-of-state status is not changed. Should you go off the assistantship, you will be charged out-of-state tuition if you have not applied for and been granted state residency. Therefore, it is often to your advantage to apply for in-state residency, especially if you know you are going to be here for several years. The requirements for residency are as follows: You must be a U. S. citizen; a permanent U.S. resident; or

hold an A, E, G, H-1 or H-4, K, or N visa to qualify for in-state tuition. You must also demonstrate intent to establish domicile. This determination is based on several factors, which include living in Virginia for one year, payment of Virginia income taxes, registering to vote, holding a Virginia driver's license, registering your automobile in Virginia, and ownership of property in Virginia.

If you are being charged out-of-state tuition and wish to be considered for in-state rates, you can go to the Graduate School's website to locate a form called "Graduate In-State Tuition Request". Allow two to three days after submitting the application to the Graduate School for it to show up on your student record, if you are approved. Out-of-state undergraduate students do not automatically receive in-state status when they enter Graduate School at Virginia Tech.

Graduate students who hold assistantships, who are classified as out-of-state residents, and earn more than \$4000 during the academic year, are eligible for a waiver of the out-of-state tuition fee. For additional information, refer to the graduate school's website.

Fellowships / Scholarships (VT campus)

SBES encourages its students to apply for externally-sponsored fellowships and scholarships to help defray their educational expenses. There are federal agencies, private foundations, and companies which offer graduate student opportunities to apply for funding. The VT graduate school serves as the coordinating office for fellowships and scholarships awarded from outside the university. Some of the organizations granting them include NIH, NSF, Packard Foundation, Ford Foundation, and the Fulbright Scholar program. There are also fellowships and scholarships which specifically target certain populations of students or seek to encourage students who are entering into a particular research area. Website searches can often uncover these opportunities.

Internally there are occasional offers of fellowships/scholarships from university units such as the VT Graduate School itself, the College of Engineering Dean's Office, the Office of Multicultural Affairs, and others. Departments often nominate candidates for these awards from the applicant pool since many of them are competitive across the campus or the College.

At Virginia Tech fellowship and scholarship recipients are required to take at least 12 credit hours each semester in which they are receiving funding. These credit hours must represent work toward satisfying minimum degree requirements. Audited courses do not qualify in satisfying this minimum.

See the Graduate School's website <http://graduateschool.vt.edu/> for further information and help in seeking these out.

Outside / Additional Employment for Graduate Students (VT campus)

Outside or additional employment for SBES graduate students is prohibited, with very few exceptions, for any students who are receiving any form of graduate assistantship from

Virginia Tech or the faculty. A waiver of this rule will only be permitted with the express written consent of both the Graduate Program Chair at VT and the Department Head at VT.

Candidacy Status Tuition Reduction (VT campus)

The Virginia Tech Graduate School offers a 10% tuition reduction for students who are in candidacy status in the upcoming academic year. The student is the one who must submit the request form.

Doctoral candidates must submit the [Graduate Candidacy Status Tuition Reduction Request Form](#) to the Graduate School each semester they wish to utilize the discounted tuition rate. Applications are due by the last day to add course registration for the semester.

For more information about this policy as well as a link to the form, please see this website:

https://graduateschool.vt.edu/academics/graduate-catalog-policies-procedures/Candidacy_Status.html.html.

Graduate Student Funding at the Wake Forest Campus

Graduate Assistantships (WFU Campus)

At Wake Forest, new PhD students may be offered a Graduate Fellowship for the first year consisting of a stipend and a tuition scholarship. The fellowship may be renewed each year for the duration of the student's program contingent upon the availability of funds and the student's academic progress.

Fellowships and Scholarships (WFU Campus)

Fellowship recipients are required to carry a full academic load (12 credit hours during fall and spring semesters + Seminar, 6 hours in the summer), and to perform duties as assigned which are established as part of the educational process and carried out at the program level. As an added benefit, the PhD student may choose to enroll in the school's health insurance program and receive a \$150 monthly supplement applied towards the premium. MS students may be offered a ½ tuition scholarship.

Additionally, individual WFU faculty members having their own funds may make financial offers to students whereby a stipend is paid and a tuition scholarship is included. The usual source of such offers is a grant that the faculty member has been awarded. The offer is extended through a letter naming the faculty member (or group) and the source of the funds. This is similar to the 'assistantships' utilized at Virginia Tech, although in this case no contract is involved. Faculty-funded students are expected to work and carry a full academic load as is the case with WFU Graduate Fellowships.

Outside / Additional Employment for Graduate Students (WFU Campus)

Students are not allowed to engage in any outside remunerative work without written permission from the department/program.

PROGRESS TO THE DEGREE (Both Campuses)

This section of the handbook contains a more detailed discussion of the various steps toward the SBES degree and items that relate to obtaining it. Topics crucial to the student's progress such as creating a Plan of Study are presented along with instructions and additional information not given elsewhere about Graduate School involvement in the student's progress. Much information with respect to the main considerations for obtaining the degree pertains to both campus locations, but in some instances, there will be procedural differences between the sites, such as how preliminary and final exams are scheduled, how committee members are approved, etc.

SBES Program Limits

In accordance to the Graduate School's requirements and rules at Wake Forest University, there is a maximum allowable time to complete degrees in the SBES program regardless of campus location:

- MS degrees in SBES must be completed within 6 years from the date of first enrollment in the SBES program.
- PhD degrees in SBES must be completed within 7 years from the date of first enrollment in the SBES program.

For special circumstances, an excused leave of absence may be approved by the Dean of the College, the Graduate School and the SBES Program Directors at each campus. If approved, the one-year leave of absence is not counted towards your time earning the degree.

At Wake Forest, there is also a residence requirement:

- For MS students: a minimum of 12 months (1 year) of full-time work or its equivalent in residence is required.
- For PhD students: a minimum of 3 years of full-time study, of which 2 years must be in full-time residence at the University.

Expected Schedule for Degree Completion

- Clinical Rotation: 1st Year – Spring Semester (PhD)
- Qualifier Exam: 1st Year – Summer (PhD)
2nd Year – Summer (If failed 1st time)
- Plan of Study Draft: By end of 1st Year (MS & PhD)
- Final Plan of Study: By end of 3rd Semester (MS & PhD)
- Prelim Exam: By end of 4th Year (PhD)
- Final Defense: By end of 3rd Year (MS) and end of 5th Year (PhD)

Good Standing

SBES graduate students are expected to remain in “good standing” throughout their academic careers. This designation means that the student is making satisfactory progress toward the degree being sought. Students who are not making satisfactory progress in the program will be contacted along with their advisors through a letter from the department and/or Graduate School and expected to improve their status in the time limit given in the letter.

GPA

One measure of good standing is the GPA. The SBES graduate program requires that students maintain a 3.0 or better GPA. If the GPA falls below 3.0, the student is placed on “academic probation” by the Graduate School, and the department is notified. Maintaining a 3.0 is also a condition for remaining on a graduate assistantship. Enrollment for one semester of probation is normally permitted to remedy an unsatisfactory GPA. If the student does not achieve a 3.0 GPA within one semester after being placed on probation, the Graduate School will consult with the department about dismissal of the student from Graduate School.

Other factors assessed which pertain to the student’s “good standing” status are research progress, filing plans of study and other degree-step documents in a timely manner, carrying a sufficient course load each semester, and participation in SBES seminars and symposiums.

STAR Report (Annual Evaluation)

At the end of each spring semester, SBES faculty advisors are required to formally evaluate the progress of their advisees by means of a Student Activity Report (STAR) which is completed by both the student and the advisor, then submitted to the SBES Graduate Office. The form is designed to allow the student to progressively track degree progress by providing places for recording goals achieved during the year, the year's activities, and goals for the next year -- across several categories: Courses/Academics, Scholarly Activity, Diversity/Equity/Inclusion, and Professional Development. Advisors provide comments and an overall rating on each. All students must also submit a CV/resume and a diversity statement with their STAR reports each year. Format for the CV/DEI statement is up to the student and is not part of the evaluation portion but should still be shared with the faculty advisor for feedback if the student is comfortable sharing. The STAR template is located in the CANVAS advising site. Required signatures of both student and advisor must be submitted with the STAR report. The originals are added to the student's file and copies of these evaluations may be requested or required by the VT Graduate School. This is MANDATORY for ALL students (both campuses). Should you finish your degree in the fall or middle of the semester, you will be required to submit a final STAR report at the time of your final defense.

Advisory Committee

Choosing an Advisor Chair

One of the most important things a new SBES graduate student needs to do during the first year of study is to select an advisor who will serve as the chair of the student's Advisory Committee. This is an important decision because of the nature of the commitments involved. The advisor supervises the student's research, usually supporting him/her financially, and the eventual success of the work can be markedly affected by the working relationship established. Students are advised to make this choice carefully, but to also be aware that if it needs to be changed, it can be. At Virginia Tech the procedure for changing advisors (after a plan of study has been filed) involves submitting a "Change of Committee/Advisor" form which can be found on the Graduate School's website.

There are four scenarios under which new students may enter the SBES program and be attached to an advisor. If a student is accepted to the WFU campus, a fellowship offer is made, and the student is attached to an appropriate advisor. If a student accepts a funded offer from a particular faculty member, that person becomes the student's advisor. At Virginia Tech there are two possibilities. In one case a faculty member may make a direct assistantship offer to a student in which case that faculty member is considered to be making a commitment to serve as the student's advisor. These offers are generally research assistantships. In the other case, an assistantship offer originates from the BMES department instead of coming from a specific person. This can be either a GRA or a GTA offer.

New SBES students who have not received assistantship offers from specific faculty members may be temporarily "assigned" to the Graduate Program Chair who serves as an interim advisor until such time as the student makes a connection with a faculty member or files a Plan of Study. The interim faculty advisor gives new students helpful information in selecting courses for the first one or two semesters of work. They help students become familiar with research opportunities among the faculty, and often assists the student in choosing a permanent advisor.

At Virginia Tech the SBES faculty are listed on the Timetable of Classes under individual research sections (5994 for the M.S. level, and 7994 for the Ph.D. level), therefore students signing up for research hours must look for their advisor's name and sign up for that particular section each semester. If an advisor has not yet been selected, students are directed to sign up under a section that is labeled "Staff". Care must be taken to

sign up for the proper section that matches the degree being pursued. Accidentally signing up under the wrong section could jeopardize the final grade, thus adversely affecting the semester GPA.

Advisor Requirements

If not assigned or established at the time of admission, the course advisor should be selected no later than the end of the second semester of study and must be an SBES faculty member (either Primary or Affiliate). In the case where a student comes into the SBES program from another department and wishes to remain with the previous advisor, that faculty member must become affiliated with SBES in one capacity or the other. The procedure for doing so involves the submission of an MOU (Memorandum of Understanding) to the SBES department head's office. This is done at both campus locations.

Graduate Advisors (i.e., Chairs of Advisory Committees) must be full-time, tenured or tenure track faculty. This applies to both campuses. Research Professors also may serve as advisors and advisory committee members if they have been approved as Graduate Program Faculty by the department / program and notification of that approval has been sent to the Graduate School. Faculty are not permitted to serve as major advisor or committee member for individuals with whom they have a personal or professional relationship (e.g., spouse, son, daughter, business associate, etc.) Graduate students (including those employed at Tech and working on degrees) may not serve on a graduate advisory committee.

For information regarding committee service by personnel other than tenure track teaching/research faculty at VT, please see the VT Graduate Catalog.

Advisors are "officially" named when the student's Plan of Study is submitted to the graduate school at which point the advisor is designated to be the chairperson of the student's graduate committee. It is permissible for students to have co-advisors for their program in which case responsibility for the student's degree progress is shared.

Advisory Committee Requirements

Prior to submitting the Plan of Study, the student must form a graduate Advisory Committee the composition of which is described in the section on Degree Requirements.

Adding an "outside" person to the committee

If an SBES student chooses to include a person who is NOT a full-time tenured or approved Graduate Faculty member at VT or WFU, the graduate schools on both campuses require an approval process in order for the 'outside' person to serve. The process is as follows:

At Virginia Tech:

- 1) The student asks the non-VT person to serve, and requests a copy of the person's current curriculum vita which is forwarded to the SBES Graduate Coordinator.
- 2) The Coordinator completes a 1-page form (Non-Virginia Tech Committee Member Registration) which must be submitted to the graduate school along with the CV. Once approved, the person can be added to the student's plan of study.

At Wake Forest:

- 1) Temporary Graduate Faculty status can be granted to a nominee when the student's advisor, graduate program director, or department chair submits a letter or an email, along with a copy of the nominee's CV to the WFU graduate deans.

- 2) For faculty with academic appointments, approval by the faculty's department chair must be indicated.
- 3) When approval is granted, notification is sent out and the nominee can be added to the student's plan.

Students are responsible for ensuring that this process is carried out in a timely manner so that the submission of the Plan of Study is not unduly delayed. This step must be done prior to plan of study submission to the SBES Graduate Coordinator. These personnel may make up no more than one-third of the minimum committee membership.

Students are to seek the advice of their faculty advisor when it comes to choosing committee members. Since committees are named on the Plan of Study, and the plans are expected to be filed by certain deadlines, it may be necessary to name members at the time of filing the plan who might not ultimately serve. Frequently it is not known early in the student's career who should sit on the committee – it is often based on the development of the student's research project. Changes can be made to advisory committees by following a process in the graduate school involving the submission of a form. Students are advised to see the SBES Graduate Coordinator for help with this process.

Plans of Study

All M.S. and Ph.D. degree-seeking students are required to file a Plan of Study with the Graduate School of Virginia Tech. The document serves as an outline of the anticipated academic details making up the student's course of study. Students work with their advisors in developing the plan which is then approved by the advisory committee and the Graduate Program Chair. The draft plan is submitted on paper to the SBES Graduate Coordinator on the VT campus where it is added to the student's file. Remember: All forms must be reviewed by the SBES Graduate Coordinator prior to obtaining committee signatures.

The final plans of study for the Virginia Tech campus students are entered into the university database system and sent electronically to the Graduate School for final approval. At this time there is no provision for the same routine on the plans of WFU students. Wake Forest SBES students work with the SBES Graduate Coordinator in Blacksburg to produce a written plan that must be signed by their committee and approved by the VT Graduate Program Chair. WFU plans go into student files, but are not submitted electronically to the VT Graduate School.

The Plan of Study (POS) is the first major benchmark assessed by the Graduate School as it monitors student progress through all steps of the degree-seeking process, and it is the first thing checked when students are being cleared for graduation. Once the plan is entered into Banner and approved by the VT Graduate School, you can view it on Hokie Spa to track its approval status (VT students only)

Plans of study should be submitted to SBES according to the following schedule:

- M.S. Draft Plans – no later than the end of the second academic semester
- M.S. Final Plans – no later than 2 months before the final exam is scheduled.
- Ph.D. Draft Plans – no later than the end of the third academic semester
- Ph.D. Final Plans – no later than 2 months before the preliminary exam is scheduled.

Making Changes to the Plan

Keep in mind that the plan is a "projection" into the future and is subject to change when circumstances dictate. Before the SBES Graduate Coordinator sends your plan electronically to the graduate school for approval, it can be altered and edited at will (with approval of your advisory committee and the Graduate Program Chair). However, once the Graduate School has approved it (at VT – for WFU students, once it has

been completely signed and approved by the VT Graduate Program Chair), it can only be changed by means of Graduate School procedures which are given below.

To make a change you must go to the VT Graduate School website and fill out the proper paperwork either to the plan itself, or to the composition of the advisory committee. There are two

(2) separate forms for this purpose at <http://graduateschool.vt.edu/forms/index.html>. Students gather committee signatures, then the form is submitted to the SBES Graduate Coordinator at VT who will obtain Department Head or Program Chair signatures, make a file copy, sign off on it, and forward it to the Graduate School. WFU students can send the SBES Graduate Coordinator the completed form as a scanned attachment to an email. Their forms will not go to the VT Graduate School, but will remain in the SBES student file.

Advisory Committee on the Plan of Study

The Plan of Study must list the Advisory Committee members. SBES requirements of the Advisory Committee as described in Section 2 of this handbook. Proposed members of your committee without a Virginia Tech ID number must be approved by the Graduate School prior to including that person on the Plan of Study. See the SBES Graduate Coordinator to fill out the necessary paperwork to get Non-VT committee members approved through the VT Graduate School. Remember: All forms must go through the Graduate Coordinator's office.

Sample Plans of Study/Forms

The SBES Canvas Advising site contains files where you can see sample plans for the Ph.D., M.S. and UG/G degrees as well as a fillable PDF of the plan of study for each degree. Students are strongly advised to study these sample plans before constructing their own in order to understand the format and related requirements. There are also links to the actual online fill-in Plan of Study forms that must be used for submission to the SBES Graduate Coordinator.

Transfer of Credit

Students may transfer graduate course credit hours from another institution to count on their plans of study.

In order to do so, however, the courses:

- . . . must be transferred from an accredited institution (preferably in the United States)
- . . . must be classified as a graduate course
- . . . must have earned a "B" or better
- . . . must have been earned as a graduate student in good standing
- . . . must be acceptable for the graduate degree program in Biomedical Engineering
- . . . must not carry grades of "S" or "P" unless the course is only offered on a pass/fail basis
- . . . must be acceptable to the student's advisory committee
- . . . must have been completed within the time limits for satisfying degree requirement
- . . . must be a course that was not taken as part of a previous earned degree at another institution

Credit for courses from other universities which do not have a similar counterpart at Virginia Tech or Wake Forest may be permitted as long as they are graduate level courses, and approval from the student's Advisory Committee has been obtained. Students may not transfer graduate level courses they took towards an undergraduate program unless they are officially in the Accelerated Undergraduate/Graduate Program at Virginia Tech.

Note: Transferred courses count only as credit hours and are not included in the calculation of the GPA.

At Virginia Tech:

MS & PhD students may transfer up to 50% of the required coursework (does not include research credits) for the graduate degree (beyond the baccalaureate). Courses beyond 5 years old will be allowed but no more than 10 years and must be approved by the SBES Graduate Directors. Courses beyond 5 years must also include a course justification form (see instructions further down) that will be processed through the VT Graduate School and the SBES program. Please plan to have transcripts and syllabus's available if needed.

At Wake Forest:

MS students may transfer up to 6 credits for the graduate degree (beyond the baccalaureate). PhD students may transfer up to 50% of the required coursework (does not include research credits) for the graduate degree (beyond the baccalaureate). Courses beyond 5 years old will be allowed but no more than 10 years and must be approved by the SBES Graduate Directors. Courses beyond 5 years must also include a course WF course justification form that will be processed through the WF Graduate School and the SBES program. Please plan to have transcripts and syllabus's available if needed.

International students on the Bowman Gray campus wishing to transfer credits are responsible for having their transcript evaluated by World Educational Services (WES), and are to have the evaluation sent directly to Graduate Student Records.

Transfer of graduate credits earned while enrolled in a previous graduate degree program at Wake Forest University. A graduate course that was completed while the student was enrolled in a previous graduate program at Wake Forest University may be considered for transfer to a second program provided that the course was not counted toward the first degree and a grade is B or better was earned. The maximum number of hours that may be transferred to a different program within the University toward a Master's degree in another program is 6.

Students at the Wake Forest campus should consult the Wake Forest Graduate School for eligibility of course transfers within the university their first enrolled semester. Transfer courses that are intended to go on the SBES plan of study should also be worked out with the SBES Graduate Directors and SBES graduate coordinator once given the ok by the Wake Forest Graduate School.

Credits are transferred when they are entered on the Plan of Study and approved by the Graduate Schools. Transfers must be approved by the Advisory Committee before a student's Plan of Study can be submitted to the Graduate School or approved by SBES.

Course Justification (Both campuses)

NOTE: If a course being transferred was taken more than five years prior to the time the Plan of Study is filed, it will be necessary to submit evidence to the Graduate School(s) that the course content is still valid, and that it should be allowed on the Plan. This is done through the course justification form obtained from the Graduate Schools. It must be filled out, signed by the committee, and submitted to the SBES Graduate Coordinator who will send it to the Graduate School when the Plan of Study is filed. Plans with courses more than five years old will not be approved by the SBES program without having course justifications included. Courses older than 10 years will also not be approved.

Transfer of Credit Procedure (Both Campuses)

- Students will prepare a draft of the plan of study for the review of the advisory committee. The SBES plan of study format includes a section for listing transfer courses where students will identify those course(s) they wish to transfer.
- The list of transfer courses must meet Graduate School requirements in that no more than 50% of the course credits on the plan can be transferred. Other conditions as listed on the page above must also be met. Research hours do NOT qualify for use as transfer credits.
- The student's advisory committee will consider the request regarding transfer credits, and approve or disapprove the draft plan of study. There must be a transcript available (should the committee request) to demonstrate successful completion of the course(s).
- At the committee's discretion, the student may be required to supply the committee with some or all of the following:
 - a) A copy of the course syllabus as taught (don't use a catalog description);
 - b) The title and author of the textbook used;
 - c) A sample of a graded assignment;
 - d) A copy of any test and/or the final exam.
 - e) A copy of the transcript showing the final grade received from the course.

In unusual cases, the committee may also decide to ask an outside expert to review the proposed course.

- If the committee approves both the plan of study and the proposed courses for transfer, they will sign off on the plan of study. Committee signatures are gathered by the student
- The plan of study document is then submitted to the SBES Graduate Coordinator at Virginia Tech for Graduate Program Chair approval (signature) and final processing.

Make sure the appropriate Graduate School has an official copy of the transcript(s) showing the course(s) you are transferring. Your Plan of Study cannot be approved without this documentation.

DEGREE COMPLETION (Both Campuses)

Students at both campuses (regardless of degree) are expected to complete their degree with a final examination that consists of a written thesis/dissertation and an oral presentation in front of their committee members. There are no non-thesis options in the SBES program. Once students have informed the Graduate Coordinator of their intent to graduate, students will be sent an email with a final list of requirements that include an oral presentation at the SBES Symposium, a final STAR report, information for creating a defense flyer announcement, an exam evaluation form that each committee member must sign, an exit survey and an alumni survey. Students will also be given a graduation gift on behalf of the program upon degree completion. Each campus has its own deadlines for defenses and students should be sure to check with the graduate coordinator as well as the graduate schools on when these dates are the semester they are planning to defend.

Degree Completion at Virginia Tech

Graduate Checklist

Students at the Virginia Tech campus should log into HokieSpa to review the graduation checklist and make sure all items have been taken care of prior to leaving.

Start of Semester Defense Exception (SSDE – Virginia Tech Campus)

Graduate students must be registered for the minimum number of credits in the semester or summer session in which they take an examination required by the Graduate School and in the semester when a degree is completed. The minimum enrollment is 3 credits except for students who may qualify for Start of Semester Defense Exception (SSDE).

Occasionally a student will have completed all degree requirements by the end of a particular semester in which they hope to graduate except for the defense. Sometimes scheduling a thesis or dissertation defense at the end of a semester is problematic because of committee schedules. In these cases, there is a mechanism in place at the Graduate School that can help alleviate the expense of registering for 3 credits the following semester just to defend.

If a student has a thesis or dissertation ready for defense at the end of a semester, but it cannot be scheduled until early in the following semester, they may qualify for this special status. This mechanism is not intended to allow the student to continue working on an incomplete thesis/dissertation. The Graduate School assumes and expects that all degree requirements (including the ETD) are completed and that only the oral defense needs to be done. To be 'ready to defend' means the student's advisory committee members must have read the thesis/dissertation and agreed that it is in a form ready for defense (i.e., the paper is finished).

The "SSDE scheduling period" is the first three weeks of an academic semester, and the Request for Final Exam and the SSDE form must be received by the Graduate School within this scheduling period. To allow for time to process the exam request (two weeks), students should make every effort to submit the SSDE form and the electronic scheduling form to the Graduate School by the end of the second week of the semester. SBES students should see the SBES Graduate Coordinator well in advance of this whole situation in order to ensure meeting deadlines.

If the student qualifies for SSDE the exam date should be set for as early as possible in the semester. If the exam needs to be delayed, the student's advisor should explain the circumstances for the delay in a letter/email to the Dean's office.

If the forms are approved the Graduate School will register the student for 1 credit in GRAD 6864 (Master's Defense) or GRAD 7864 (Doctoral Defense). Students cannot enroll themselves in SSDE. If the student does not qualify for SSDE, they must register (and pay for) the minimum 3 credits required.

Students enrolled in SSDE will be classified as less than half-time students. This could create issues with student loans and financial aid. International students should consult the Graduate School for the visa implications of this status. Students on SSDE are NOT eligible to hold assistantships or fellowships.

ETD "Electronic Thesis/Dissertation" (Virginia Tech Campus)

Virginia Tech requires that all M.S. theses and Ph.D. dissertations be submitted to the Graduate School in electronic form in order for the degree to be conferred. The thesis/dissertation must be approved by the student's Advisory Committee. Committee members signify their approval through the electronic sign-in system for administering exams created by the Graduate School.

Complete instructions for the student on creating, formatting, and submitting an ETD can be found at <http://etd.vt.edu> . Additionally, all SBES students are expected to go to the Graduate School's website, http://graduateschool.vt.edu/academics/commencement_deadlines , where there is an entire section dealing with ETDs, commencement, deadlines for document submission, etc. It is the student's responsibility to learn the routines and procedures regarding ETDs and graduation required by the Virginia Tech Graduate School.

Graduation/Commencement at the Virginia Tech Campus

To be eligible for hooding at Commencement, the Final Examination must be completed and the Electronic Thesis/Dissertation (ETD) must be approved by the Graduate School by the published deadline for the semester. See the Graduate School's website for these deadlines.

The Hooding and Awards Ceremonies are held twice a year. Spring graduation is in May and summer/fall graduation is held in December. Watch for more information on graduation dates and regalia ordering from the graduate school. Students who do not wish to "walk" during the fall ceremony are welcome to come back and attend the spring ceremony instead.

Diplomas will be sent to students in the mail. Students who need degree completion letters should check HokieSpa. Please note these are delayed up to a month past commencement so there may be a delay in getting one if you need it.

Degree Completion (Wake Forest Campus)

The Wake Forest Graduate School has set up a Canvas site (on the WF side) that has very detailed and specific instructions as to how the process works. The steps in Canvas walk students through every item that is needed and what they need to do to complete each step, in order to move onto the next step. Students should also be sure to check in with the WF Graduate School when they are ready to defend to make sure they have completed all necessary forms and procedures. It is EXTREMELY important that if you are getting ready to defend (MS, Prelim, or PhD) that you also keep Mollie Plunkett AND Kelsey Wall in the loop! There are additional program requirements that you will also need to complete in addition to the items that the WF Graduate School requires of you. These requirements include but are not limited to: an oral presentation at the SBES Symposium, completion of the SBES Exam Evaluation forms by each committee member, creation of a defense announcement, SBES exit survey, and SBES alumni survey.

Graduation/Commencement at the Wake Forest Campus

To be eligible for hooding at Commencement, the Final Examination must be completed and the Electronic Thesis/Dissertation (ETD) must be approved by the Graduate School by the published deadline for the semester. See the Graduate School's website for these deadlines.

The Hooding and Awards Ceremonies are held one a year in May. All September and January graduates will be invited to attend the May ceremony at WFU. Watch for more information on graduation dates and regalia ordering from the graduate school.

Students at the WFU campus who wish to walk instead at the VT commencement may do so but will need to notify the SBES Graduate Coordinator and the VT Graduate School ahead of time.

Congratulations! You made it to the end of this really long document!