



# Cornell Biomedical Engineering PhD Student Handbook

## The Cornell BME PhD Program

The Nancy E. and Peter C. Meinig School of Biomedical Engineering (BME) at Cornell University focuses on interdisciplinary research to achieve a quantitative understanding of human biology across spatial and temporal scales, with the goal of improving human health. The primary mission of the Meinig School of Biomedical Engineering is to educate students to understand the human body as an integrated system and the mechanisms of disease through quantitative engineering analysis, and to use that understanding to design better therapeutic strategies, devices, and diagnostics.

As a student in the Cornell BME PhD program, you are an integral part of this vision and our efforts to advance biomedical engineering in the research areas of (1) Biomechanics & Mechanobiology, (2) Biomedical Imaging & Instrumentation, (3) Drug Delivery & Nanomedicine, (4) Molecular & Cellular Engineering, (5) Tissue Engineering & Biomaterials, and (6) Systems & Synthetic Biology. Cornell's commitment to interdisciplinary research allows for a broad range of research opportunities to BME students. Mentored by and collaborating with outstanding faculty, the goal for every BME student is to make an important and long-lasting research contribution in his/her chosen area of expertise.

The following three components are the essential pillars of a successful BME PhD degree at Cornell:

- 1) Completion of an original research project that makes an important contribution to a field of biomedical engineering and that establishes the student as an expert in his/her chosen area;
- 2) Acquiring a broad foundation plus in-depth academic knowledge in a chosen area of specialization, achieved by successfully taking advanced classes in biomedical engineering and two chosen minors throughout the course of the PhD program;
- 3) Clinical and teaching experience, obtained through the BME clinical immersion program at Weill Cornell Medicine and a minimum of one semester of service as a Teaching Assistant.

By far the largest amount of effort will be devoted to research. At the same time, continued learning, in the form of taking advanced graduate classes in areas selected by the student in consultation with his/her Special Committee, will ensure substantial depth of knowledge and academic expertise in the chosen research area. In addition, the Cornell BME PhD program encourages students to participate in the multitude of outreach opportunities offered, including service to local middle and high schools, teaching, and public engagement to serve the broader community.

## **Special Committee**

Each student's progress towards the PhD degree is supervised by a Special Committee composed of Cornell graduate field faculty members chosen by the student. The supervision of a student's PhD program by the Special Committee allows for individualized programs tailored to each student's specific interests that can seamlessly merge traditional disciplines. For PhD degree candidates, the Special Committee is composed of at least three faculty members: the PhD thesis advisor and two members who represent the two minors selected by the student. The PhD thesis advisor, who must be a BME graduate field member, serves as the chair of the Special Committee. PhD students select one minor in the life sciences (i.e., biology, biophysics, biomedical science, etc.) and one minor in a traditional engineering discipline (outside BME), often the area of undergraduate specialization. Study in the engineering minor is expected to be equivalent to the core course sequence of PhD students majoring in that field. This combination provides breadth in general approach and depth in at least one specific engineering discipline.

The Special Committee is responsible for approving whether classes chosen by the student fulfill the two minor requirements. Students are strongly encouraged to select minor Committee members who can provide helpful guidance towards the student's PhD thesis while also matching the academic background or interest of the student. The Special Committee members representing the minors are responsible to ensure that the student satisfies the requirements set by the field represented in the minor, which can include classes taken and additional requirements. The Graduate School Fields of Study is a useful resource to identify the graduate field affiliation of Cornell faculty: <https://gradschool.cornell.edu/cugradfos/>.

Please note that the Special Committee can have more than three faculty members. However, there is no requirement that everyone with whom a student works be on the committee and larger committees create challenges, e.g., scheduling a meeting is more difficult. Faculty members who are not part of a Cornell graduate field can be included as *ad hoc* Committee members: <http://gradschool.cornell.edu/forms> (Ad Hoc Committee Member Request form).

Students can change their Special Committee anytime during their PhD. Committee changes after the A-exam require the dean's approval, and the B-exam may not be scheduled within three months of a committee change. Changing the committee chair should be discussed in advance with the Director of Graduate Studies. Please note that changing the committee requires approval from all members of the newly formed committee, but does not require approval from committee members who are leaving the committee. Any member of the committee, including the chair, has the right to resign from the committee at any time. It is the responsibility of the student to reconstitute a Special Committee. If a student fails to reconstitute a committee, they are not permitted to continue registration in the Graduate School. You can find additional information at: <https://gradschool.cornell.edu/academic-progress/requirements-milestones/special-committees/changing-your-committee/>

## **Degree Requirements**

To earn the BME PhD degree, a student must fulfill the following requirements:

- Pass the comprehensive Admission to Candidacy examination ("A Exam") with the Special Committee before the beginning of the seventh semester of study
- Successfully complete the coursework required by his/her Special Committee
- A minimum of one semester of teaching experience, which can be fulfilled through a Teaching Assistant (TA) position or successful completion of the *BME 7030 Graduate Student Teaching Experience*. Please note that registering for BME 7030 requires prior approval from the DGS and the course instructor, and must be discussed with the DGS ahead of time.
- Conduct original research that will have lasting value, and write a dissertation recording that work
- Pass the final examination ("B exam") defending the dissertation with the Special Committee
- Have a minimum of six academic terms of full-time study

A student is recommended for the Ph.D. degree when his/her Special Committee members agree that the appropriate level of scholarly achievement has been reached and that the Graduate School's requirements have been satisfied.

Please note that the A- and B-exams are requirements for all graduate students at Cornell, with strict rules governed by the Graduate School. Individual graduate fields can impose additional requirements on students. Unlike many other departments at Cornell, BME does not require a Qualifying exam (Q-exam).

Students who have successfully completed the A-exam have the option of receiving a Master's of Science degree, in Biomedical Engineering, without any additional requirements. This choice, which does not affect any plans to continue on to the PhD degree, must be approved by the Special Committee and indicated by checking the appropriate box on the form for the A-exam completion.



## **Coursework**

The goals of the coursework are to provide students with both breadth across a wide range of BME and depth in a particular specialization within BME. The extent of required coursework depends on each student's previous preparation and goals. Please note that students must confirm registration and course enrollment at the beginning of each semester (including summer registration).

### **Required courses**

All students in the BME PhD program must take the following courses:

- BME 7010: Seminar for First-Year Biomedical Engineering Ph.D. Students (Fall of 1<sup>st</sup> year)
- BME 7020: Biomedical Engineering Research Seminar (total of 6 semesters)
- BME 7130: Core Concepts in Disease (Spring of 1<sup>st</sup> year)
- BME 7160: Immersion Experience in Medical Research and Clinical Practice (Summer of 1<sup>st</sup> year)
- BME 7900: Biomedical Engineering Graduate Colloquium (total of 6 semesters)

### **Suggested courses**

Course selection beyond the required courses is up to each student in consultation with the Special Committee. Because the Special Committee is responsible for approving classes chosen by the student to fulfill the minor requirements, students are strongly encouraged to discuss course selection plans with their Special Committee, particularly with the relevant minor representative. Students are encouraged to select additional courses of interest, but should discuss how to balance the associated time commitment with their research progress with their thesis advisor.

The courses listed below are suggestions by faculty and current/past BME PhD students, sorted by research area. Please note that this list is not comprehensive and should serve only as a starting point for identifying courses of interest relevant for each student's career interests.

### **BIOMECHANICS & MECHANOBIOLOGY**

BME 5810: Soft Tissue Biomechanics

BME 5620: Biomineralization

BME6230: Cancer and Immuno-Engineering

BME 6410: Cell and Molecular Mechanobiology

BME 6640: Mechanics of Bone

BME 6680: Cancer for Engineers and Physicists

BTRY 6020: Biometry II

CEE 6720: Introduction to Finite Element Method

MAE 4650: Biofluid Mechanics

MAE 5700: Finite Element Analysis for Mechanical and Aerospace Design

MAE 6110: Foundations of Solid Mechanics I

MAE 6160: Advanced Composite Materials

MAE 6670: Soft Tissue Biomechanics II: Viscoelasticity and Phasic Theory

VETCS 7010: Pathophysiology of Orthopedic Surgery

### **BIOMEDICAL IMAGING & INSTRUMENTATION**

BME 6180: Principles of Magnetic Resonance Imaging

BME 6260: Optical Microscopy and Fluorescence Methods

BME 6320: Modern Biomedical Microscopy

BME 6330: Optical tools for studying living systems

BME 6670: Nanobiotechnology

AEP 3300: Modern Experimental Optics

CS 4780: Introduction to Machine Learning

CS 5780: Machine Learning for Intelligent Systems

ECE 4300: Laser and Optoelectronics  
ECE 4760: Digital Systems Design Using Microcontrollers  
ECE 5970: Machine Learning with Biomedical Data (co-listed in BME)  
PHYS 7680: Computational Physics

### **DRUG DELIVERY & NANOMEDICINE**

BME 6210: Engineering Principles for Drug Delivery  
BME 6680: Cancer for Engineers and Physicists  
BIONB 3920: Drugs and the Brain  
CHEM 6700: Fundamental Principles of Polymer Chemistry  
CHEME 5430: Bioprocess Engineering  
VETMM 6100: Cell and Molecular Pharmacology

### **MOLECULAR & CELLULAR ENGINEERING**

BME 6110: Stem Cell Bioengineering  
BME 6120: Precision and Genomic Medicine  
BME 6130: Engineering the Microbiome  
BME 6680: Cancer for Engineers and Physicists  
BEE 7600: Nucleic acid engineering  
CHEME 5430: Bioprocess Engineering  
CHEME 7770: Advanced Principles of Biomolecular Engineering  
MAE 6630: Immuno-engineering

### **TISSUE ENGINEERING & BIOMATERIALS**

BME 5620: Biomineralization  
BME 6650: Principles of Tissue Engineering  
BME 5830 Cell-Biomaterial Interactions  
BME 6680: Cancer for Engineers and Physicists  
MAE 6160: Advanced Composite Materials  
MAE 6630: Immuno-engineering

### **SYSTEMS & SYNTHETIC BIOLOGY**

BME 6110: Stem Cell Bioengineering  
BME 6120: Precision and Genomic Medicine  
BME 6130: Engineering the Microbiome  
BTRY 6830: Quantitative Genomics and Genetics  
BTRY 6840: Computational Genetics and Genomics  
BTRY 6391: Bioinformatics Programming  
CHEME 5430: Bioprocess Engineering  
CS5780: Machine Learning for Intelligent Systems

### **CLASSES OF GENERAL INTEREST**

#### **BIOLOGY**

ANSC 4270: Fundamentals of Endocrinology  
BIOMG 4370: Cell Proliferation, Senescence, and Death  
BIOMG 4000: Genomics  
BIOMG 4880: Cancer Genetics  
BIOMG 4390: Molecular Basis of Disease  
BIOMG 4450: Stem Cell Biology  
BIOMG 6310: Protein Structure and Function  
BIOMG 6330: Biosynthesis of Macromolecules  
BIOMG 6360: Functional Organization of the Eukaryotic Cell  
BIOMG 6390: The Nucleus

BIOMG 8340: Quantitative Biology for Molecular Biology and Genetics  
BIOMS 3150: Basic Immunology  
BIOMS 6110: Genome Maintenance Mechanisms  
BIOMS 7050: Advanced Immunology  
BIOMS 7190: Immunology of Infectious Diseases  
BIOMS 7900: Seminars in Stem Cell Research  
NS 4900: Manipulating the Mouse Genome  
NS 5410: Applied Anatomy and Physiology I  
VETMM: The Chemistry and Biology Behind Cell Signaling  
VTBMS 7010: Mouse Pathology and Transgenesis

### **STATISTICS**

BTRY 6010: Statistical Methods I  
BTRY 6020: Statistical Methods II

### **BUSINESS/MANAGEMENT**

AEM 6145: Business as a Second Language  
ILRHR 7451: Leadership Assessment for Managers  
PLBRG 4050: Invention and Technology Commercialization: IP Management for Scientists, Engineers & Entrepreneurs

### **APPLIED MATH**

CHEM 7870: Mathematical Methods of Physical Chemistry

### **OTHER**

BME 4440: Science Policy Bootcamp: Concept to Conclusion  
ALS 6015: The Practice of Teaching in Higher Education  
BIOMG 7510: Ethical Issues and Professional Responsibilities  
ENGRG 7930: Peer Mentoring and Leadership Essentials  
BIOMS 5665: Cancer Engagement Seminars  
CHEM 6030: Communication Boot Camp  
ELSO 6230: Designing and Delivering Effective Presentations  
ELSO 6520: Learning to Write in Your Field  
MAE 7070: Professional Product Design Studio

### **NON-CORNELL COURSES**

- Coursera: Writing in the Science (<https://www.coursera.org/learn/sciwrite>).  
The course teaches scientists to become more effective writers, using practical examples and exercises. This is a free online course spread over 8 weeks, but participants can watch the online videos anytime. The course offers a certificate option for \$79, but this is not required or necessary.

## **Work-in-Progress Seminar for Biomedical Engineering Ph.D. Students**

The *BME 7020 Biomedical Engineering Research Seminar* is an integral part of the BME PhD Program. It features work-in-progress presentations by current BME PhD students and is held twice a month, with some exceptions during the winter and summer breaks. The presentations are open to the entire BME field, including students and faculty. The goal of the *BME 7020* presentations is to provide students with an opportunity to present their research to a broad audience, and to collect feedback from faculty and their peers. In addition, the *BME 7020* seminars are intended to stimulate intra-departmental collaborations and interactions by letting students and faculty learn about ongoing research in other laboratories in the BME field. For this reason, BME PhD students are strongly encouraged to register for *BME 7020* and attend the bi-weekly presentations. Students are required to successfully complete a minimum of 6 semesters of *BME 7020*.

BME PhD students in their 5<sup>th</sup> semester and beyond will be required to present their research once a year in the *BME 7020* seminar. Participation of students in earlier semesters, and those close to defending their thesis (i.e., having scheduled the B-exam), is optional. Interested students should contact the DGS and/or Graduate Field Assistant if they would like to present.

The format of *BME 7020* consists of two presentations per seminar, with each presentation limited to ~20 minutes, plus ~5 minutes of questions from the audience. The presentations can have different formats, depending on the current degree progress of the student. For students early in their PhD (e.g. 5<sup>th</sup> and 6<sup>th</sup> semester), the presentation may focus more on the proposed work, with some preliminary results. For more advanced students, talks can be complete research stories, similar to a conference talk, or work-in-progress presentations, in which more active feedback is encourage to guide the direction of the work or help ‘make sense of it’. Students can use the *BME 7020* seminar as an opportunity to practice upcoming conference talks, but should ensure that the talk is suited for a broad BME audience. Unlike conference talks, it is expected that work presented can be more preliminary, and constructive feedback from the audience is highly encouraged. Students attending the seminar are required to complete brief feedback forms for each presenter. Attending faculty will provide additional feedback to the presenters following the seminar. Since the *BME 7020* seminars also serves as an excellent opportunity to update the special committee members on recent research progress, special committee members are strongly encouraged to attend presentations by their students.

Presentation slots will be assigned before the beginning of the semester. We plan to schedule more senior students (4<sup>th</sup> and 5<sup>th</sup> year) earlier in the year, and more junior students later in the year, thus giving the newer students an opportunity to observe presentations before presenting their own research. Students who are unable to present at the assigned slot are urged to contact the organizer at the beginning of the semester, or to arrange with one of the other presenters to swap seminar dates.



## Timeline Towards PhD Degree

<b>Semester (month)</b>	<b>Benchmark/Comment</b>
1 <sup>st</sup> semester (August/September)	<b>Meetings with prospective advisors/labs.</b> Students are strongly encouraged to explore a number of different laboratories, meeting with the faculty member and with current lab members. Many students attend lab meetings for the labs of interest and/or perform mini-rotations in the labs.
1 <sup>st</sup> semester (October/November)	Most students decide on a thesis advisor by the end of October/early November). Once they have joined a lab, students should <b>discuss plans for the immersion term</b> with their advisor and <b>identify potential clinical mentors</b> at Weill Cornell Medicine, Memorial Sloan Kettering or Hospital for Special Surgery.
1 <sup>st</sup> semester (End of November)	All first-year students should select a thesis advisor (Special Committee Chair) by the end of November and start to discuss plans for the immersion term with their thesis advisor.
1 <sup>st</sup> semester (End of December)	<b>Latest time to select a thesis advisor.</b>
2 <sup>nd</sup> semester (January/February)	<b>Finalize plans for the immersion term with faculty advisor;</b> contact potential clinical mentor to check availability; discuss plans and expectations.
2 <sup>nd</sup> semester (March-May)	<b>Complete any required training and immunization for Immersion term</b>
2 <sup>nd</sup> semester (June-August)	Students spend ~8 weeks on the <b>Clinical Immersion</b> term at Weill Cornell Medicine in New York City, with additional summer time spent on research in the advisor's lab in Ithaca.
3 <sup>rd</sup> semester	<b>Decide on the minor members for the Special Committee.</b> The Special Committee must have at least three members: the PhD advisor (a BME field member) and two Cornell faculty members representing the two minors: (1) engineering minor (non-BME), and (2) Life Science minor. Students should meet with prospective minor members to discuss their willingness to serve as minor committee member and their potential contributions to the student's planned PhD program. Class requirements for the minor fields should also be identified and discussed. Committee must be finalized by the end of the 3 <sup>rd</sup> semester.
5 <sup>th</sup> or 6 <sup>th</sup> semester	<b>Completion of A-exam.</b> The A-exam must be completed before the beginning of the 7 <sup>th</sup> semester (4 <sup>th</sup> year). Taking the A-exam earlier offers the advantage of providing an early opportunity to collect constructive feedback on the planned PhD research project. Students should have sufficient preliminary data to support the motivation of the work and the (general) feasibility of the approach. Prior publication is not required. Students should discuss expectations with their PhD advisor and Special Committee members well before the 6 <sup>th</sup> semester.
5 <sup>th</sup> to 10 <sup>th</sup> semester	<b>Students should meet at least annually with their Special Committee</b> to discuss research progress and, particularly from the ~8 <sup>th</sup> semester on, to discuss the plans required towards graduation. Materials such as an updated CV, conference abstracts, publications and transcript, should be distributed in advance of the meeting.
10 <sup>th</sup> semester	<b>Completion of B-exam,</b> thesis submission, and degree conferral.

**Important note:** Students who do not have a committee chair and have not joined a laboratory by the end of their second regular semester in the Ph.D. program are not considered to be making adequate degree progress and for that reason their funding from BME is ended.

Please see below for a list of relevant deadlines and requirements by the Cornell Graduate School:

<https://gradschool.cornell.edu/academics/thesis-dissertation/understanding-deadlines-and-requirements>

## **Suggested Formats for A- and B-exam**

### **A-exam**

**Written document.** While not required by all PhD advisors, a written document can help to structure and communicate the plans for the PhD research to the committee members. The specific format and requirements may vary with the Special Committee. Thus, students are urged to discuss expectations and specific requirements with their Special Committee. One suggested format is a 6-10 page (single spaced) document outlining plans for the PhD research project and providing an overview of key preliminary data (unpublished and any publications) supporting the motivation and implementation of the research plan. The document should include 1 page of Specific Aims, 1-2 pages of background/introduction, followed by preliminary results, description of the planned research, and a timeline with key milestones. The written document and the *A-exam schedule form* should be submitted to the committee 10 days prior to the scheduled A-exam and no less than 7 days prior to the exam. The form can be obtained from [Belinda](#) or at <http://gradschool.cornell.edu/forms> (Schedule A Examination).

**Oral presentation.** The oral presentation is required by the graduate school and should provide background and information on the planned research, a list of specific aims, preliminary results, an overview of the research strategy, and a projected timeline. Students should plan for a ~30-40 min presentation. With discussion and interruptions for questions, the actual presentation and full A-exam typically run 2-3 hours.

**Transcript and list of classes.** Belinda will provide the committee with a transcript of classes taken at Cornell. The student will discuss with their committee whether these classes fulfill the requirements of the two minors and any additional classes that may be helpful in the training and the success of the PhD project. The course requirements for the minors should be addressed much earlier than the A-exam to allow the student to plan and to avoid surprises.

**Results form.** Students should bring the A-exam results form to the A-exam to collect signatures from the committee immediately after completion of the exam. The form can be obtained from [Belinda](#) or at <http://gradschool.cornell.edu/forms> (Results of A Examination). Following the exam, the student must return this document to Belinda for submission to the Graduate School.

### **B-exam**

The B-exam consists of an oral, public presentation, followed by a closed session with additional questions and discussion by the Special Committee. The public presentation has the style of a seminar in which the student highlights his/her research accomplishments. The presentation is typically ~45 minutes in length.

The thesis should be submitted to the Special Committee ~4 weeks prior to the B-exam to give the committee sufficient time to evaluate the work and to prepare questions. If a full month is not feasible, the student should notify the committee members and get approval of an altered schedule. The thesis must be submitted prior to the B-exam. Following the B-exam, the student is tasked with making any necessary revisions to the thesis. The final thesis has to be approved by the Special Committee and the Graduate School before the PhD degree can be conferred. The student has to email the final version to the committee at the time of filing the final thesis approval with the Graduate School; the document is not sent to the committee automatically.

The graduate school provides a time-line with the relevant dates for scheduling the exam, submitting the thesis draft, and the Committee approval: <https://gradschool.cornell.edu/academics/thesis-dissertation/understanding-deadlines-and-requirements>

The *B-exam schedule form* should be submitted to the committee 10 days prior to the scheduled B-exam and no less than 7 days prior to the exam. Please also book a room for your presentation well ahead of time. Belinda can help with this reservation. The guidelines for the format and writing of the thesis, provided by the Cornell Graduate School, can be found here: <https://gradschool.cornell.edu/academic-progress/thesis-dissertation/writing-your-thesis-dissertation/guide-to-writing-your-thesis-dissertation/>

## **Immersion Term Information**

The immersion term is a unique experience of the Cornell BME PhD program and provides first-year PhD students with the opportunity to experience actual clinical practice in a hospital setting and to participate in clinical research. The immersion term is approximately in the 2<sup>nd</sup> week of June through the beginning of August (8 weeks). The purpose of this clinical summer immersion program is to provide substantial clinical experiences for biomedical engineering graduate students to help shape their understanding and appreciation of challenges and needs in medicine. Each student will be matched with a clinician mentor. The mentor selection should be driven by the student and his/her PhD research advisor, in consultation and coordination with Professor Yi Wang, who oversees the immersion program. Housing and transportation to and from the immersion term will be provided.

Students will shadow their clinician mentors and their partners, engage in focused study of specific anatomy, pathology, and diagnostics and treatments, participate in an ongoing research directly related to clinical practice, attend a Bioethics seminar, and any additional relevant clinical seminars, and gain exposure to any other aspects of clinical culture. You can find additional information at:

<https://www.bme.cornell.edu/bme/programs/graduate-programs/phd-program/phd-summer-immersion-term>

The specific objectives of the Immersion term are:

- 1) Acquire basic knowledge of the bioethical issues concerning human subject research.
- 2) Acquire basic understanding of a clinical specialty – anatomy and disease process, diagnosis and treatment methods and technology.
- 3) Learn to identify the need and challenges of technology in clinical practice, and to formulate from an engineering perspective the problem of and solution to such challenges.
- 4) Learn how clinicians think, formulate and solve problems, and how to effectively work with busy practicing clinicians.

Please note that the mentor must be a practicing clinician. Students are strongly encouraged to start discussing potential clinical mentors with their PhD research advisor shortly after matching with a laboratory, ideally by the end of their first semester (Fall) at Cornell. Early planning allows the student, clinical mentor, and PhD research advisor to make plans for the clinical research project and any required training and certification well in advance of the summer immersion term.

Students are strongly encouraged to read the following text (Chapters 1-9) to prepare for the Immersion term: [http://pre.weill.cornell.edu/mri/pages/book/chapter\\_1.html](http://pre.weill.cornell.edu/mri/pages/book/chapter_1.html)

### **Certification and documentation requirements**

All students must complete and pass the several certification exams prior to the start of the immersion program: CITI program (<https://www.citiprogram.org>) courses on Human Subject Research (HSR), Good Clinical Practice, and Responsible Conduct of Research (RCR). Some clinical assignments (e.g., at the Hospital for Special Surgery) may require additional training and certification.

Students are required to submit the necessary medical documentation to gain clearance to access to the operating rooms at Weill Cornell Medicine and other patient medical records. Students should complete all necessary immunization and collect all required medical documentation prior to the start of the immersion term! **Failure to complete these requirements in time can result in additional costs and delays!** Students will also need to complete weekly blogs, additional online safety trainings, and human resource documentation to gain the necessary access to the hospital resources.

## **Cornell PhD Minors, Certificates, and other Programs**

With the approval of the student's advisor, Cornell offers a few options for PhD students to minor in another discipline.

### Graduate Minor in Stem Cell Biology:

Graduate students from any discipline at Cornell are invited to enroll in the Graduate Minor in Stem Cell Biology. The minor gives students across the university the opportunity to take advantage of the wide variety of stem cell biology research offered by Cornell faculty. This minor graduate field is intended to provide both broad and specific training in the rapidly developing areas of stem cell biology and regenerative medicine. For additional information: <https://www.stemcell.cornell.edu/scp-gradminor.cfm>

### Entrepreneurship Certificate for Engineering Ph.D. Students:

Cornell continues this legacy by integrating entrepreneurial teaching and learning into all aspects of the university experience. As an active participant in the university-wide Entrepreneurship@Cornell program (<http://eship.cornell.edu/>), the College of Engineering has a wide range of courses, events, and experiential learning activities designed to help students begin their journey of business creation and success in any engineering discipline. For additional information: <https://www.engineering.cornell.edu/students/graduate-students/phd-students/entrepreneurship-opportunities-phd-students>

### Ph.D. Commercialization Fellowship:

The Commercialization Fellowship is an opportunity for engineering Ph.D. students to take a deep dive into the commercialization process and potential real-world applications of university inventions. The Cornell College of Engineering is offering Commercialization Fellowships—a unique opportunity for Ph.D. students to spend a fully-funded semester and summer in an intensive entrepreneurship program with a personal mentor to explore commercializing a product of the student's choosing. From intellectual property management to supply chains, students will learn the tools, methods and skills for bringing a product or technology to market. The fellowship experience will enable deep experiential learning in the commercial side of innovation, and one-on-one mentoring assures a deep, personalized educational experience unmatched by traditional entrepreneurship programs. For additional information: <https://www.engineering.cornell.edu/students/graduate-students/phd-students/phd-commercialization-fellowship>

## **Contact Information**

### Director of Graduate Studies

Peter Doerschuk  
Weill Hall, Room 121A  
Phone: (607) 255-4179  
e-mail: [pd83@cornell.edu](mailto:pd83@cornell.edu)

### Graduate Field Assistant

Belinda Floyd  
Weill Hall, Room 121A  
Phone: (607) 255-2573  
e-mail: [bh42@cornell.edu](mailto:bh42@cornell.edu)

### Graduate School

143 Caldwell Hall  
607-255-5820

### Diversity Programs in Engineering

146 Olin Hall  
607-255-6403

### Office of Inclusion and Student Engagement (OISE)

384 Caldwell Hall  
607-255-5417

### Dean of Students

207 Willard Straight  
607-255-1115

### International Students & Scholars Office

B-50 Caldwell Hall  
607-255-5243

## **Resources Available Online**

### Research Resources and Facilities:

- Cornell NanoScale Science & Technology Facility (CNF): <http://www.cnf.cornell.edu/>
- Cornell Center for Materials Research (CCMR): <http://www.ccmr.cornell.edu/>
- Core Facilities at Cornell
  - Biotechnology Resource Center: <http://www.biotech.cornell.edu/biotechnology-resource-center-brc>
  - Cornell RNA Sequencing Core: <http://rnaseqcore.vet.cornell.edu/>
  - Genomics Facility: <http://www.biotech.cornell.edu/brc/genomics-facility>
- Cornell Stem Cell Program: <https://www.stemcell.cornell.edu/index.cfm>
- Libraries:
  - Cornell Library Catalog: <https://newcatalog.library.cornell.edu/>
  - Engineering Library: <https://engineering.library.cornell.edu/>
  - Passkey to access online journals: <https://www.library.cornell.edu/services/apps/passkey>

### Career Development and other Resources:

- Careers Beyond Academia Program to enhance training opportunities for graduate students and postdoctoral scholars for careers beyond conventional academic research: <https://gradcareers.cornell.edu/>
- Canvas Course: Career Development Toolkit: <https://canvas.cornell.edu/courses/14918>
- Pathway to Success Program: <https://gradschool.cornell.edu/pathways-success>
- Career Services for Graduate Students: <http://www.career.cornell.edu/students/grad/index.cfm>
- Tax information: <https://www.dfa.cornell.edu/tax/students/studenttaxfaq>
- Office for Global Learning: <https://globallearning.cornell.edu/>
- Student Health Plan: <https://studenthealthbenefits.cornell.edu/>
- Resources and support for students with families: <http://studentswithfamilies.cornell.edu/>

### Funding Opportunities:

- Information on fellowships offered by the Cornell Graduate School (see the left sidebar): <http://www.gradschool.cornell.edu/costs-and-funding/fellowships>.
- Cornell graduate school fellowship database: <http://www.gradschool.cornell.edu/fellowships>
- Cornell Conference Travel Grants: <http://gradschool.cornell.edu/forms> (Conference Grant Application)
- Child Care Grant Program to offset expenses for graduate student-parents: <http://studentswithfamilies.cornell.edu/students-with-children/student-child-care-grant/>
- Overview of opportunities: [https://www.osp.cornell.edu/Funding/funding\\_opps.html](https://www.osp.cornell.edu/Funding/funding_opps.html)
- NIH Fellowships: <https://researchtraining.nih.gov/programs/fellowships>
- NSF Graduate Research Fellowships: <https://www.nsfgrfp.org/>
- National Defense Science and Engineering Graduate (NDSEG) Fellowship Program (US citizens only): <https://ndseg.sysplus.com/>
- The National GEM Consortium Fellowships for underrepresented minorities: <https://www.gemfellowship.org/>

### Cornell Rules, Guidelines, and Policies:

- Cornell Graduate School general information: <http://gradschool.cornell.edu/>
- Graduate School Policy and Regulations: <http://gradschool.cornell.edu/policies>
- Code of Academic Integrity: <http://cuinfo.cornell.edu/aic.cfm>

- Grievance procedures, including third-party mediation: <https://gradschool.cornell.edu/grievances-and-complaints>
- Title IX and Sexual Harassment Reporting – Office of Institutional Equity and Title IX: <https://titleix.cornell.edu/>
- Cornell Policy 6.3 on Consensual Relationships: <https://titleix.cornell.edu/policy-6-3/>
- Cornell Policy 6.4 on Prohibited Bias, Discrimination, Harassment, and Sexual and Related Misconduct: <https://titleix.cornell.edu/policy-6-4/>
- Change in Special Committee (including Special Committee Chair/Advisor): <https://gradschool.cornell.edu/academic-progress/requirements-milestones/special-committees/changing-your-committee/>
- Student-Advisor mentoring guidelines and resources: <https://gradschool.cornell.edu/academic-progress/advising-guide-for-research-students-2020/>

#### Relevant Cornell forms

- Graduate School forms: <http://gradschool.cornell.edu/forms>
- Graduate School resources: <http://gradschool.cornell.edu/resources>
- Diversity and Inclusion resources (Engineering): <http://www.engineering.cornell.edu/engdiversity/>
- Health and Wellness resources: <https://health.cornell.edu/services/counseling-psychiatry>
- International Student resources: <https://globallearning.cornell.edu/>
- Responsible Conduct of research: <https://www.oria.cornell.edu/rcr/trainingRequirements.htm>

#### NIH F31 Fellowship

- NIH F31 Fellowship website: <https://researchtraining.nih.gov/programs/fellowships/F31>
- Advice and consideration document by Aaron Chiou, BME PhD '20 and NIH F31 awardee: <https://cornell.box.com/s/xvcn4wtqfnhkov2kaj0qkkel04fk0lht>