



Department of Bioengineering

UNIVERSITY OF COLORADO
DENVER | ANSCHUTZ MEDICAL CAMPUS

Graduate Student Handbook

2022-2023

*The year of this guide corresponds to the year of regular entry into the program. It will also be the “catalog year” for the student’s major.

Denver Campus Office

Department of Bioengineering,
College of Engineering, Design and Computing
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Denver, Colorado 80217

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How to use this Handbook

This guide is intended to provide information, rules, regulations, policies and procedures for the graduate programs in Bioengineering, the College of Engineering, Design and Computing, and CU Denver | Anschutz Medical Campus. It is recommended that students interested in pursuing a degree in Bioengineering contact the Graduate Program Manager prior to applying to CU Denver.

A copy of this Student Guide is available to every student in the Bioengineering Program. Each student is responsible for reading, understanding, and complying with all rules, regulations, and policies stated in this publication for their degree program of interest.

A revised copy of this Guide will be provided to each degree-seeking student annually. Addenda to the Guide will be published and distributed as necessary. The Department of Bioengineering, with consultation from other University staff and administration, will address issues not explicitly mentioned in this Guide as needed.

CU Denver, the College of Engineering, Design and Computing, and the Bioengineering program reserves the right to revise information, requirements, policies, rules, and regulations at any time. Whenever changes occur, every effort will be made to notify students who may be impacted.

Important Acronyms

AMC = Anschutz Medical Campus

AY = Academic Year

BIOE = Bioengineering

BS = Bachelor of Science

DC = Downtown Campus

MS = Master's in Bioengineering

PhD= Doctorate in Bioengineering

BMES = Biomedical Engineering Society

BUAC = Bioengineering Undergraduate Affairs Committee

GAC = Graduate Affairs Committee

GPA = Grade Point Average

About the Program

The Department of Bioengineering Mission

The mission of the CU Denver | Anschutz Department of Bioengineering is to improve human health through the application of engineering principles, ideas, methods and inventions in order to solve important clinical problems.

The Department of Bioengineering Program

The Department of Bioengineering is the first program of its kind in Colorado, offering students unparalleled opportunities as they learn and work on Colorado's only academic medical campus. The combination of technical learning, immersive experiences in the clinical and biomedical enterprise beyond the classroom, and out-of-classroom opportunities to learn about cutting-edge patient care and research, is provided by only a handful of universities across the United States.

Bioengineering is a true dual-campus department and program. Administratively, the Department of Bioengineering is within the College of Engineering, Design and Computing, located on the Downtown Campus (DC) in Denver. Physically, the department is located on the Anschutz Medical Campus (AMC) in Aurora. Undergraduate students complete the first portion of their studies on the Downtown Campus, and then complete their degree at AMC. Graduate students will spend the majority of their time on the medical campus; however, they may choose to and are permitted to enroll in classes on the downtown or Boulder campuses.

The consolidation of the Downtown Campus (DC) and the Anschutz Medical Campus (AMC) provides unprecedented instructional resources in bioengineering and research opportunities in health sciences. Students have opportunities to learn from clinicians and engineers and to perform research or medical device design in world-class hospitals and clinical research labs.

The Department of Bioengineering is housed in Bioscience 2 and Bioscience 3 at AMC. This state-of-the-art facility offers specialized teaching spaces including a Biomechanics and Bioinstrumentation Lab, a Biomechanical Analysis Lab, a Design and Prototyping Lab, a Light Machine Shop, a Biomaterials with Cell/Tissue Culture Lab, and a Clinical Simulation and Assistive Technology suite. The building also offers students several community spaces to meet, collaborate, study, and socialize.

Academic Calendar

The Department of Bioengineering follows the Downtown Campus academic and holiday calendars, which are sometimes different from the Anschutz Medical Campus calendar. Please pay close attention to the appropriate calendars and check with professors or program administrators if you have any questions or concerns. Students may find the Academic Calendars on CU Denver Registrar's website.

Faculty & Staff

The program strives to create an atmosphere that is respectful and inclusive, with an emphasis on the student. All faculty and staff have open-door policies and will communicate office hours; scheduling a one-on-one meeting is the best way to ensure staff availability.

Bioengineering Events

The University of Colorado Denver and the Anschutz Medical Campus are continually hosting events across disciplines; students are encouraged to attend events that may deepen their understanding of a particular topic of interest, and engage in the greater CU Denver community through involvement in clubs, academic honor societies, and other organizations. The Department of Bioengineering hosts several events as well.

New Student Orientation

The week before fall classes begin, all students starting coursework at the Anschutz Medical Campus are invited to New Student Orientation. This one-day event includes an orientation to students' academic program and the medical campus, as well as an opportunity to speak to continuing students, hear from faculty and learn more about the department's culture, opportunities and resources.

Teaching Assistant and Grader Training

All students who accept a position as a TA or Grader are responsible for participating in the TA and Grader training at the beginning of the semester, as well as intermittent TA and Grader check-ins with Department of Bioengineering TA and Grader Leader Mitch VeDepo, Mitch.Vedepo@cuanschutz.edu.

Students are also required to take the following Skillsoft training, if not already taken:

CU: Discrimination and Sexual Misconduct - CU Denver | Anschutz

CU: Open Information Security and Privacy Awareness – CU Denver | Anschutz

Recruitment and Community Events

As part of the bioengineering community, students may be asked to participate in recruitment and community events sponsored by the department. These may include open houses, high school visits, laboratory tours, conferences etc.

Other Department Events

The Department hosts events during the lunch hour (12:15-2:00pm) nearly every Tuesday during the semester. These may be a Lunch & Learn, where a lecturer comes in to share exciting information and opportunities for students. Lunch & Learns feature a variety of speakers, from industry professionals to career preparation experts to biomedical nonprofit leaders. Research in Progress lectures are presented by graduate students, and showcase their Master's or PhD research work.

The Department also hosts a Bioengineering Seminar Series that typically occurs on Fridays during the lunch hour. These feature prominent bioengineering research faculty from around the country and are a great way to learn more about the field.

Student Organizations

Biomedical Engineering Society (BMES)

Promotes a collaborative and inclusive community to advance human health through education, discovery, and translation. For more information, contact bmes@cuanschutz.edu.

Bioengineering Empowerment Program (BEEP)

Created in 2020 as a way to provide opportunities and resources for high school students to gain access to engineering, medicine, and other STEM fields, BEEP is a community oriented, student-led initiative. It connects local high schools and high school students with the bioengineering program at the CU Denver and CU Anschutz campuses. Throughout the year, BEEP will provide mentorship, tutoring, activities, events, lab tours, presentations, and other ways for high school students to engage with the resources available at the CU campuses. For more information, contact BEEP@ucdenver.edu.

Society for Biomaterials (SFB)

A multidisciplinary society of academic, healthcare, governmental and business professionals dedicated to promoting advancements in all aspects of biomaterial science, education and professional standards to enhance human health and quality of life. For more information, contact societyforbiomaterials@cuanschutz.edu

Society of Women Engineers

Not-for-profit educational and service organization that empowers women to succeed and advance in the field of engineering and to be recognized for their life-changing contributions as engineers and leaders. For more information, contact SWE@UCDenver.edu.

Academic Integrity Policy & Expectations of Students

Academic Integrity

Research Honesty and Integrity

As a future bioengineer, students should adhere to the highest standards of professionalism in research and conduct. Examples of unprofessional conduct include misrepresenting effort, credentials, or achievement in either an academic or professional setting; any action that compromises the quality or safety of patients, research subjects or colleagues; violation of patient or student confidentiality; and falsification of data. Read the full [Academic Integrity Policy](#) effective as of January 1, 2020.

A summary of the policy follows:

- I. This policy applies to all forms of academic misconduct including plagiarism, cheating, fabrication and falsification, multiple submissions, misuse of academic materials, and complicity in academic misconduct in BIOE courses, graduate exams, and academic research in the Bioengineering department. Students should familiarize themselves with definitions and standards in the policy.
- II. Violations will initially be handled by the instructor of record for the course, with expectations and consequences per the course syllabus or BioE Academic Integrity Policy. In most cases, the student accepts the finding and consequence and a record of the incident is kept by the BioE academic integrity committee (BIOE AIC) in an internal file to document any cases of repeated violations. This record will not be shared outside the department and will not appear on transcripts or academic reports.

- a. Example: A student copies a Wikipedia entry without attribution in a weekly homework assignment. The instructor informs the student that this violates the plagiarism standards and the student will receive a 0 on that assignment and agree to complete a SkillSoft training module on plagiarism, with a warning that another incident of plagiarism in that course will result in the student failing the course. The student agrees and the incident is reported to the BIOE AIC.
- III. If the student disagrees with the finding, the incident spans multiple courses, or the student has 3 or more academic integrity violations in separate courses in the department, the Department Chair can convene the BIOE AIC to investigate. The BIOE AIC, comprised of 2 faculty and 2 students, will report on their findings and recommendations within 30 days and the department chair will inform the student.
 - a. Example: An instructor tells students they can work together on homework assignments but not other assignments. Assignments are due each class and at the end of the first module an assignment is given not labeled as homework but without notifications about collaborative work. Two students work together on it and their submissions have the same errors. The instructor informs the students that they will receive a zero on the assignment. The students appeal to the department chair who has the BIOE AIC investigate. The BIOE AIC finds that the students did work together but the assignment did not clearly indicate that work was to be individual and the structure of assignments could be confusing. Per their recommendation, the department chair informs the students that they will receive only a warning and the incident will not be recorded as a violation but any further collaboration on individual assignments will result in failing the course. The department chair also informs the instructor that individual assignment must be clearly labeled on the assignment in order to enforce this course policy.
- IV. The student may appeal the chair's decision to the College of Engineering, Design, and Computing Disciplinary Committee, with a further appeal possible to the CU Denver Academic Integrity Committee.

Conduct Expectations

The Bioengineering program strives to create an atmosphere that is respectful and inclusive, with an emphasis on student growth and learning. To create such an environment, it is critical that all members of the bioengineering community and degree program understand and aim to meet clearly defined expectations.

Alcohol and Drug Use

Students must adhere to current University policy governing alcohol consumption on campus and at official functions. Access to University of Colorado Hospital and the Children's Hospital Colorado require passing a standard drug test. In addition, the Anschutz Medical Campus is a smoke-free zone.

Alcohol and/or drug abuse compromises the student's ability to learn and to practice as a researcher and is thus considered unprofessional conduct. Students who attend class and appear

to be cognitively impaired as a result of drug or alcohol intoxication may be dismissed from class and/or referred to University Student Services for further action.

Professionalism

As current and/or future professionals, students are expected to adhere to the highest standards of professionalism during their academic career. This means that students adhere to the professional and ethical standards of their respective fields, and the academic and honor code expectations for the University of Colorado Graduate School.

The University of Colorado Graduate School has a commitment to accepting a diverse culture and highly values multiple perspectives. This means that not only is discrimination of any form unacceptable, but the University upholds the expectation that students remain open-minded, and respectfully discuss and interact with diverse backgrounds and perspectives.

Examples of unprofessional conduct include misrepresentation of effort, credentials, or achievement in either the academic or professional setting; any action which compromises the quality or safety of consumer care; violation of confidentiality; and any other conduct unbecoming a professional practitioner or researcher. When conducting research, individuals need to comply with research guidelines established by the IRB.

Although it is not possible to list every situation that violates the Academic Integrity Expectations of the Graduate School at University of Colorado Denver and Anschutz Medical Campus, the following examples will provide a reference point:

- Academic Dishonesty
- Complicity with Academic Dishonesty
- Plagiarism
- Cheating
- Fabrication and Falsification
- Submission of the same papers more than once or for different classes
- Misuse of Academic Materials
- Any conduct, both on and off campus, that interferes with the student's ability to perform his/her classroom, laboratory, or professional duties or reflects poorly on the University
- Violation of any University of Colorado, Anschutz Medical Campus, Denver Campus, or Graduate School policy

The program expects that all graduate students will conduct themselves with the utmost integrity in academics, research, service and outreach. Regular class attendance is key to success in the program. As a graduate student, students will have more freedom in setting their research schedule. Students must respect the lab's culture and requirements, such as lab meetings.

Students who have issues or concerns regarding a class, faculty, staff or another student in the program may address such concerns with the persons involved. If an issue cannot be resolved and/or such an approach is inappropriate or uncomfortable, students should contact the Graduate Program Manager for assistance.

Grievances

Any time an issue or concern with an instructor, faculty, staff or fellow student occurs, please try addressing that person directly first. If the students are unable to resolve the problem or feel uncomfortable confronting the person, they may go to the Graduate Program Manager, the advisor, the Department Chair or the Graduate Affairs Committee for advice. If the issue cannot be satisfactorily resolved through those avenues, additional resources are available through the College of Engineering, Design and Computing, the Graduate School and the University, and the College of Engineering, Design and Computing website for more information).

Email

Email is the official platform for communication at the university. Students must use their CU Anschutz email address for all correspondence with university officials including faculty, staff, and administration. Students may expect department faculty and staff to respond to email within 2-3 working days, after which they are encouraged to send a respectful reminder.

University Conduct Support

The Office of Student Conduct and Community Standards serves as a resource to the entire University community through its efforts to meet the developmental and educational needs of students related to community expectations, civility and respect for self and others. A list of resources can be obtained at the Tivoli Student Union, Suite #277 or at <http://www.ucdenver.edu/life/services/standards>.

Student Resources

A complete list of campus life student resources for the Downtown Campus can be found here: <https://www.ucdenver.edu/student-life>. Bioengineering is academically and administratively a downtown department and program, so students have access to resources through the Downtown Campus student services offices. CU Anschutz student services can be found here: <https://www.cuanschutz.edu/student>

Student Services

Bioengineering Student Services

The Department of Bioengineering currently employs two full-time student services professionals, a Graduate Program Manager, located at Anschutz, and an Undergraduate Program Manager on the Downtown Campus.

Office of Student Affairs

The [CU Anschutz Office of Student Affairs](#)' mission is to enhance student life at the Anschutz Medical Campus of the University of Colorado Denver by providing excellence in specific non-academic and academic student services. They are located on the Anschutz Medical Campus in Education II North – Third Floor Suite, 3200.

Student Senate

[Student Senate](#) is the interdisciplinary student governance group at CU Anschutz. Representatives are elected from every class in every school or program. They are responsible for the creation and oversight of the Senate funding requests, which allocates money to affiliated and campus wide organizations on campus. Senate is also responsible for planning and overseeing campus-wide senate sponsored events and activities. Senators address complaints and ideas for improving student life on campus, act as official liaisons between students and administration, attend meetings regularly and become involved in various committees and their work. Meetings are held every 2nd and 4th Monday of each month.

UCDAccess

The online [Student Self-Service Portal](#) allows you to apply for financial aid, search for and enroll in classes on the medical and Denver campuses, pay your tuition bills, order transcripts and more. To log into the UCDAccess portal, you will need your official University username and password.

Equal Opportunity and Non-Discrimination

Notice of Non-Discrimination

The University of Colorado Denver | Anschutz Medical Campus does not discriminate on the basis of race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy in admission and access to, and treatment and employment in, its educational programs and activities. The University takes affirmative action to increase ethnic, cultural, and gender diversity; to employ qualified disabled individuals; and to provide equal opportunity to all students and employees.

Students may report allegations of discrimination or harassment to the [Office of Equity](#) at equity@ucdenver.edu and/or calling the office at 303-315-2567.

Title IX Notice of Non-Discrimination

The University of Colorado does not discriminate on the basis of sex, gender or sexual orientation in its education programs or activities. Title IX of the Education Amendments of 1972, and certain other federal and state laws, prohibit discrimination on the basis of sex in all education programs and activities operated by the university (both on and off campus). Title IX protects all people regardless of their gender or gender identity from sex discrimination, which includes sexual harassment and sexual assault.

Title IX requires the university to designate a Title IX Coordinator to monitor and oversee overall Title IX compliance. Your campus Title IX Coordinator is available to explain and discuss: your right to file a criminal complaint; the university's complaint process, including the investigation process; how confidentiality is handled; available resources, both on and off campus; and other related matters.

Contact the Campus Title IX Offices:

Phone: 303-315-2567

Email: equity@ucdenver.edu**Anschutz Medical Campus**Education 2 North
5th Floor / 13120 E. 19th Ave,
Aurora, CO 80045**Denver Campus**Lawrence Street
Center, 12th Floor
1380 Lawrence Street
Denver, CO 80217Additional information regarding Title IX is available at: <https://www.ucdenver.edu/offices/equity>.**Disability Resources**

The [Office of Disability, Access, & Inclusion](#) welcomes qualified students with disabilities and is committed to providing equitable access to our programs. Students who meet the technical and admission standards of our programs (with or without accommodations) partner with our office to establish access by identifying and removing barriers related to their disability.

Please [schedule an appointment](#) with their office to begin the accommodation process.

Police and Safety

The University of Colorado Denver and the Anschutz Medical Campus are committed to the safety and security of our students, faculty, staff and visitors. Emergency personnel are available on both campuses. Contact information is below.

Denver Campus Police:Auraria Campus Police
Department 1201 5th Street,
Auraria Campus Administration Building (Suite
110) From Cell Phone: 303-556-5000
From Campus Phone: 9-1-1**Anschutz Medical Campus Police:**The University Police Department, Anschutz Medical
Campus Building 407, 12454 E. 19th Place.
For an emergency, dial 911.
For police dispatch and non-emergencies, dial 303-724-4444.**Badging & Room Access**

Anschutz Campus Badging

Students get their University of Colorado Anschutz badge at orientation from the Security Badging Office in the Fitzsimons Building on the Anschutz Medical Campus. Students bear the costs of replacement badges. All campus community members are required to wear their badges visibly at all times.

This badge serves the dual purpose of identification and access to many interior and exterior locations. All Bioengineering students are granted regular student access to campus. All other access is added on a need-only basis, and usually takes some time to get the proper approvals, so please plan ahead!

Additional badges (i.e. hospital badges) may be necessary to conduct research. Badging requests will only be made at the request of the advisor and upon the approval of the badging authority. Badge sharing is not permitted. Please direct all badging renewal requests, concerns, and questions to the Graduate Program Manager.

Room Reservations

Student Services Staff can assist with room scheduling. Please speak with the Graduate Program Manager with any questions.

Bursar's Office

The Bursar is responsible for all financial activities related to student billing, tuition collection, institutionally managed loan programs and coordination with the state. Please contact them at bursar@ucdenver.edu

Denver Campus
Student Commons
Building 303.315.1800

**Anschutz Medical
Campus**
Education 2 North
303.315-1800

Resources for Books

The Anschutz Medical Campus Bookstore is located in Education 2 building. However, most bioengineering instructors do not send their booklists to the Bookstore. They will direct students to other resources prior to or at the start of class. Please contact instructors with specific questions.

Computers can be purchased at academic discount prices. Visit the Auraria Campus Bookstore on Downtown Campus. Students may also ask Apple or Dell directly for the discount.

Auraria Campus Bookstore
Tivoli Building, Suite 105
303.556.4286

**Medical Campus
Bookstore**
Ed 2 South
303.724.2665 (4-BOOK)

There are excellent libraries located on both campuses, and Bioengineering students have access to either one.

Auraria Library
1100 Lawrence St.
303.315.7763
<https://library.auraria.edu/>

Straus Health Sciences Library
12950 E. Montview Blvd
303.724.2152
<https://library.cuanschutz.edu/>

Health and Wellness

Campus Gyms

The Lola & Rob Salazar Student Wellness Center, located on the Downtown Denver Campus, is a state-of-the-art facility for students of CU Denver. This brand new facility boasts a rock climbing wall, swimming pool, and more.

The Medical Campus is home to the Anschutz Health and Wellness Center. It offers world-class research, education and wellness services in one facility. In addition to high quality gym facilities and group fitness, both wellness centers host cooking classes and wellness services such as massage.

Student membership to either gym requires a monthly fee.

The Phoenix Center at Anschutz

The [Phoenix Center at Anschutz](#) is a free and confidential resource for students, faculty, and staff who are affected by interpersonal violence (IPV) including relationship violence, sexual violence, and stalking. Visit www.thepca.org/ for more information.

Campus Community Health

[Campus Community Health](#) (CCH) is designed to meet convenient care needs of anyone who works or studies on campus. The CCH strives to enhance a multi-disciplinary care experience for students by providing a spectrum of physical and behavioral healthcare in an integrated care model, thereby exposing future scientists, health professionals and public health practitioners to seamless and coordinated systems of care. They are located on campus at 1890 N. Revere Ct., Suite 5040, Aurora, CO 80045

CU Anschutz CARE Team

The [Campus Assessment, Response & Evaluation \(CARE\) Team](#) is committed to improving campus safety and student success by evaluating individuals that may pose a risk safety of themselves or others. The team coordinates with students, faculty, and staff as well as concerned others to identify, assess, and intervene with individuals of concern.

Student Health Insurance

All degree and specific approved, certificate-seeking students on the Anschutz Medical Campus must enroll in the university's Student Health Insurance (SHI) Plan unless they can provide evidence of enrollment in other comparable insurance. Students enrolled in less than five credit hours in a degree program are eligible to purchase the SHI Plan by submitting a selection/waiver form by the deadline, or Census Day. Students must be registered in order to access university health insurance.

PhD and MS students are automatically enrolled in health insurance once they've registered for classes. If students choose to use their own insurance, it is important that they waive the coverage by the deadline. If utilizing university insurance, no further action is necessary and

coverage will automatically activate a couple days after the waiver period ends. PhD and MS students must opt-in to dental insurance in order to utilize this benefit. Please go to the [Student Health Insurance page](#) to complete the necessary steps. Please note that for SHI, bioengineering students are considered Anschutz Medical Campus students and should contact the Medical Campus office. Funded PhD students who are required to enroll in the SHI Plan will have insurance premiums paid as part of their tuition and fees

The Student Insurance Office is available to assist with selecting or waiving the SHI Plan. They can help evaluate student's insurance needs so they choose the best plan available. Please direct all plan specific and coverage specific questions to the Student Health Insurance

Office:

studentinsurance@cuanschutz.edu
Education II, North Room 3200
13120 E 19th Ave, Aurora, CO 80045
303-837-2127

Housing

Anschutz Medical Campus Student Services

The Anschutz Medical Campus Office of Campus Student Services maintains listings of students who are looking for roommates. These listings can be found here <https://www.cuanschutz.edu/student/resources/housing>.

Several apartment complexes have preferred employer/student programs that give application discounts to AMC students.

Parking and Transportation

The Anschutz Parking and Transportation Services office is located in Fitzsimons Building on the 2nd floor (west side of the food court eating area). This office assists students with any request and question regarding parking on campus. Their office can be contacted at 303-724-2555.

Students who take classes at the Downtown Campus or Boulder campus may ask the parking office for a "Reciprocal Parking Pass" which will allow access to specific parking lots (check their parking maps) on those campuses at no additional charge if the pass is hung from the vehicle mirror.

Students will have a charge for the RTD College Pass on their account every term. This mandatory fee supports the RTD pass for all students, which includes all regular fixed route services, including bus (local, express, regional), light rail, call-n-Ride, and skyRide service (free to Medical Campus students with RTD College Pass). Services not included in College Pass are Access-a-Ride, BroncosRide, RockiesRide and other special event services. Students may get their RTD College Pass from Badging and Security with their badge.

Registrar's Office

The Registrar is responsible for all grade and course scheduling activities, including transcripts, schedule adjustments, course catalog & curriculum management, changes of record, residency, and personal student information including name change.

Denver Campus
Student Commons
Building 303.315.5969

**Anschutz Medical
Campus**
13120 E. 19th Ave.
303.724.8000

Bioscience 2 Resources

Lounge and Study Spaces

Bioscience 2 has a Bioengineering-only student lounge with refrigerators, microwaves, and more. There is ample room for sitting, studying, and socializing in the lounge and study rooms.

Lockers

Students may claim a locker in Bioscience 2 by selecting any open locker not in use. To claim a locker, students must provide their own lock. Students must empty out the locker at the end of the academic year (spring semester). Lockers that have not been cleaned out at the end of the year will be emptied and all contents thrown away.

Printing

A student printer is available for all students to use in the Bioscience 2 Student Lounge. In addition, Anschutz Printing Services offers copying, printing and binding services and there are computer lab locations across campus, including the Education Buildings, Research 1 and the Health Science Library.

The Graduate Program in Bioengineering

As a department within the College of Engineering, Design and Computing, Bioengineering is considered a Denver Campus department. As such, the graduate program in Bioengineering works most closely with the downtown side of the consolidated Graduate School. Students will interact with the Graduate School at all stages of their studies, from admission to graduation. Many of these interactions are managed collaboratively between the Graduate School, the College of Engineering, Design and Computing, and the department. However, graduate students spend the majority, if not all of their time at the Anschutz Medical Campus.

Graduate Program Governance

Graduate Affairs Committee: The Graduate Affairs Committee (GAC) consists of one committee chair, four core faculty members from Bioengineering, the Graduate Program Manager, and a graduate student representative. The GAC is responsible for all aspects of the Bioengineering graduate program, including routine transactional issues to developing and

implementing strategies to increase national rankings and research excellence. The GAC will also evaluate and make recommendations to the chair for any changes on policies and procedures pertaining to graduate curriculum, affairs, and admissions. Among some of its provisions, the GAC serves as the approving authority for core course substitution and extension to milestone deadlines.

The Graduate Committee in the 2022-2023 academic year:

Dr. Jeffrey Jacot-
Chair

Dr. Dae Won Park
Dr. Emily Gibson

Dr. Cathy Bodine
Dr. Richard Benninger
Graduate Program Manager-Natalie Kersten
Graduate Student Representative-Madeline
Blankenship

The Interim Department Chair for AY 2022-2023 is Dr. Keith Neeves. You may need to meet with the Department Chair to request exceptions to policy or to address concerns. Dr. Neeves is available by appointment to discuss your academic and career goals.

The Graduate Program Director is Dr. Jeffrey Jacot. Dr. Jacot will need to approve defenses and exams, though the Graduate Program Manager will route most of these for approval. Feel free to schedule a meeting with Dr. Jacot to discuss any program concerns or advice.

Program Requirements & Academics

University Training Requirements

The University delivers most of its safety and other training online through SkillSoft via UCD Access (accessible upon matriculation). All students must take (and remain current on):

- CU: Chemical Waste Management
- CU: Lab Safety
- CU: Regulated Medical Waste Management
- CU: Bloodborne Pathogens
- CU: HIPAA Regulations
- CU: Information Security and Privacy Awareness
- CU: Discrimination and Sexual Misconduct - CU Denver | Anschutz

Students may be required to take additional training modules depending on their research project or teaching duties. Graders and Teaching Assistants must attend the TA and Grader Training organized by CU Online at the beginning of the term and take the following Skillsoft training: CU: FERPA. University of Colorado Hospital Access Requirements

In order to participate in some of the exciting clinical training opportunities at the University of Colorado Hospital (UC Health) and/or Children's Hospital Colorado, students will be required to provide documentation of current vaccinations or titers as well as pass a background check, 10-panel drug test and safety training. Students must also be able to provide proof of current health insurance. The cost of the background check and drug test will be covered by student fees through the department. Note that the 10-panel drug test includes marijuana and cannabis-derived products and can detect usage in the previous 2 weeks dependent on the frequency of use.

The department will not provide students with copies of their University of Colorado Hospital documentation. In addition, such documents will not be shared with a third party, even at the student's request. Therefore, it is strongly recommended that students make copies of all documents (including vaccination records) prior to submission.

Student Methods & Research Seminars and Examination Talks

The Department of Bioengineering facilitates Research in Progress Lectures, where graduate students have the opportunity to practice their presentation skills while sharing their research with the rest of the program. The decision to sign up for a Research in Progress Lecture is typically made by a student's research advisor. All students are encouraged to attend these events.

Student examinations (PhD comprehensive exam, dissertation defense, MS thesis defense) will be advertised by the Bioengineering Department with an email containing the date, time, location and abstract at both the Anschutz Campus and the Downtown Campus.

The Bioengineering Seminar Series occurs approximately every other week, usually on Fridays at 12:30pm. This seminar series invites prominent bioengineering faculty from across the country and the world to present their research. Additionally, most speakers will meet with students at some point in the day. Each year, we invite one student chosen speaker based on recommendations from the graduate and undergraduate students. Please make every effort to attend these talks, as they are good learning experiences.

Coursework Requirements

MS students will take an additional fifteen credit hours outside of the 15 required credits for a total of 30 credit hours. These fifteen credits hours must include three to six credit hours of project or thesis (BIOE 6960 or BIOE 6950) plus nine to twelve credit hours of elective courses. Students may not exceed 6 credit hours for project/thesis.

PhD students will take an additional 9 credit hours outside of the 21 required credits of didactic (instruction-based) coursework and 30 credit hours of dissertation (BIOE 8990). Students are expected to outline the entire program of study at their preliminary examination before the start of the second year. The exam committee may make recommendations for changes to this plan. Students must also plan their dissertation credits carefully.

Elective Course Selection

There is not a “list” from which students may select elective coursework; for an MS degree, students may include no more than 6 hours of 4000 (senior) level courses from another program (cannot be BIOE), and for a PhD degree, all elective coursework must be graduate-level (5000 or above). In addition, electives must be relevant to the student’s degree plan, and approved by the student’s thesis/project or dissertation committee in advance. Undergraduate-level coursework cannot be applied toward a PhD degree in Bioengineering though it may be allowed for an MS degree.

Enrollment Policies

Taking Classes at another CU campus

Students who wish to take classes at CU Boulder or Colorado Springs must submit an “Intercampus Enrollment Form” to the Graduate Program Manager. This form can be found on the [Registrar’s Office website](#). Once this form is processed, CU Denver Registrar’s Office will manually enroll the students on the first day of the term. Please note that this means that popular classes may fill up before that day. Talking to the professor ahead of time may help, as professors can often grant enrollment even if the class is officially full (if classroom capacity allows). Please be sure to have a backup option in case the class is full before the first day of the term.

Enrollment Status

According to the [Office of the Registrar](#), full and part-time graduate statuses are defined as:

Full-time:

- 5 or more semester hours
- 1 or more credit hours of thesis (BIOE 6950), project (BIOE 6960) or dissertation (BIOE 8990)

Half-time:

- 3 - 4.5 semester hours

Enrollment Status and Funding

Individual students receiving financial aid may be required to complete hours in addition to those listed above. The exact requirements for financial aid will be listed in the student's financial aid award letter and students are encouraged to contact the Financial Aid Office directly with questions regarding enrollment expectations.

Other types of funding (i.e. grants) may also require certain enrollment status. Therefore, it is critical that students work closely with their direct funding source (i.e. a specific grant source) regarding enrollment expectations.

Finally, enrollment status may impact student employee withholdings. Visit [Student Employee Payroll](#) for more information.

Registering for research credits

All students registering for research credits (BIOE 8990, BIOE 6960, BIOE 6950) must email the Program Manager the following information, cc'ing their Research Mentor/PI in order to be permissioned into the course:

- Student ID
- Term/Year
- Course Number
- Section Number
- Credit Hours

PhD Full-time Enrollment Requirements

The Department recommends that PhD students remain full-time every semester (including summer in which one semester hour of dissertation is considered full-time) prior to passing the comprehensive exam.

Courses, Grades & Academic Probation

Students must maintain a **cumulative GPA of 3.0**. This will include all coursework that students take during their graduate program, regardless of where the courses are taught (Anschutz Medical Campus, Denver Campus or the Boulder Campus) or what level they are (graduate or undergraduate). Please note that CU Denver does not allow grade replacement: all grades count towards cumulative GPA.

Pass = B-
and GPA

A passing grade as defined by the Graduate School is a **B- or better**; only courses with a grade of "B-" or better will count towards the final degree requirements. Any course with a grade of "C+" or lower must be retaken. Students may choose a different course if it is an elective course. Both grades will count towards the cumulative GPA.

A few other grades that students may see on their transcripts: "W": this grade appears when students withdraw after Census Date.

"IP": All master project/thesis or PhD dissertation hours are reported as "IP" (in progress)

until the final defense exam. At this time, the “IP” grade will be changed to a letter grade. Per Graduate School rules, if cumulative GPA falls below a 3.0, students will be placed on academic probation and will have two semesters to raise their cumulative GPA to above a 3.0. (These two semesters do not include summer if, during the summer, students only take thesis/project/dissertation credit. This is because the credit will be graded as IP until the defense exam. However, if students are not enrolled in any course for graded credit during the summer, the summer term will count toward the two-semester academic probation). Failing to raise the cumulative GPA to at least a 3.0 after two semesters of academic probation results in high risk of being suspended from the program.

Before the next semester starts, students are required to meet with their faculty advisor, the Graduate Program Manager and/or the Department Chair to develop a plan to raise their GPA. Students on probation cannot register for classes on UCD Access until they complete this step. The Graduate Program Manager can assist with this process.

“I”: An incomplete grade (I) should only be assigned if a) the majority of coursework has already been completed and b) of the cause for a student’s inability to complete the required work is outside the student’s control (disease, passing of a family member, etc.) the failure to complete the work in time is due to causes outside a student’s control. (In all other cases, students should be encouraged to withdraw from the course so as not to impact their GPA. Courses from which a student withdraws after the add/drop date are graded with W). Incomplete work has to be completed in one academic year. The Registrar automatically changes an I to a failing letter grade (F) after one (1) year, unless a grade change is initiated by the Course Director. If a student enters military service before completing a course and an I is reported, this grade may be carried on for the duration of the student’s service, provided this service requirement has been communicated to the Graduate Program and the Graduate School.

Withdrawing from a Class

Students may withdraw from a class up until Census Date each semester without it being recorded on their transcripts. Withdrawals after Census Date will be recorded on final transcript with a grade of "W." To withdraw from a class after Census Date, please fill out the [Schedule Adjustment Form](#) and ask the instructor to sign. After the second drop deadline, the Dean also has to sign.

Please refer to the [Academic Calendar](#) for more details.

Repeating a Class

Per the Graduate School Handbook, a student who received a failing grade (less than a “B-“) in a required class may repeat that class one time only. Both grades will appear on the transcript and be included in the GPA. A recorded grade of W counts as an attempt. Students may withdraw from or fail a class the first time taking it, but must pass it the second attempt. Failure to meet course requirements could result in dismissal from the graduate program at the end of the term in which the failing grade or withdrawal from a required course occur the second time.

Program of Study Sheet

It is critical for students to establish their Program of Study during the first semester. The Program of Study is a list of all the courses students need to take to meet the degree requirements.

It is acceptable and even expected that the program of study may change as students learn more about bioengineering and the available research opportunities. However, by documenting these courses and subsequent changes each semester, students and their Academic/Research Advisor can ensure that they are on track to meet all the Bioengineering and Graduate School requirements. Having regular conversations with the advisor about academic progress can avoid miscommunication and misconceptions that may delay graduation.

To help with this planning, there is a Program of Study form for each degree program ([MS](#) & [PhD](#)).

Independent Study

Students may choose to do an independent study and count it as an elective for the degree. Students must check in with their faculty advisor first. If the instructor is not a core BIOE faculty member, students need to ask their faculty advisor to serve as the instructor of record. They must fill out a Special Processing Form, attach a syllabus with specific assignments for each week, course objectives and grading rubrics, and submit them to the Graduate Program Manager. It is important to understand that the independent study **must be different** from the final project or thesis. The GAC will review and make the final decision.

Transferring Credit

The Graduate School Rules define the guidelines for transferring credit toward a graduate degree at CU Denver. The Department of Bioengineering defines the process by which these transfers must be approved. Please refer to the [Graduate School Rules](#) and consider the following:

1. The maximum amount of transfer work that may be applied toward the MS degree is twelve (12) hours of coursework and thirty (30) hours of coursework for the PhD degree.
2. Master's courses applied to one previously conferred Master's degree program may not be applied to our MS program. However, graduate level coursework (5000 level or higher) taken for a Master's degree may be applied toward the PhD program with the instructor and the GAC approval. Likewise, coursework taken for a completed doctoral degree may be applied toward a concurrent or subsequent Master's degree with the program approval.
3. MS students complete the [Transfer Credit Form](#) and submit to the Graduate Program Manager. The GAC will review and make the final decision.
4. PhD students can request transfer course evaluation after completing one full-time semester with a passing GPA of 3.0. Students should complete the [Transfer Credit Form](#) and submit to the Graduate Program Manager. Once approved by GAC, the Graduate School will review and make the final decision.

Substituting a Core Class

Though the course offerings in Bioengineering continue to expand each year, and new courses are added that satisfy core class requirements, students' area of research interest may dictate that other courses would be more valuable. In this case, students may petition to substitute a core class with another graduate level class offered in the CU system. Please obtain approval from the faculty advisor first, then complete a [Petition a Core Class Substitution](#) and submit it to the Graduate Program Manager **at least one month before the semester starts**. The GAC will review this petition and notify the result to the student via email.

Withdrawing from the Program

Students may choose to leave the Bioengineering program for academic or non-academic reasons. CU Denver system will automatically deactivate student accounts if no classes are enrolled during three consecutive semesters, including summer. However, if students wish to be formally withdrawn from the program, please work with the Graduate Program Manager to complete the necessary paperwork. Remember to return any keys, badges or parking permits.

Degree Options

Entrepreneurship Certificates

The [Jake Jabs Center of Entrepreneurship](#) in the CU Denver Business School offers two certificates that may be of interest to Bioengineering students:

- [Entrepreneurship Certificate](#)
- [Bioinnovation and Entrepreneurship Certificate](#)

Both certificates require that students select from collections of courses with business and entrepreneurship foci. Graduate-level courses from these programs will meet the BIOE MS elective requirement. PhD students should consult with their mentors about the relevance of these courses to their programs of study.

It may be possible that the BIOE MS project, MS thesis or PhD dissertation satisfies the capstone requirement for the certificates, provided that the work has an entrepreneurial component and involves a Business School faculty member. Students should speak with the Business School for more information and guidance.

Graduate Certificate in Medical Device Design and Entrepreneurship

The graduate certificate in medical device design and entrepreneurship includes nine credits of coursework and three credits of project work. It is open to anyone interested in a graduate certificate. More information can be found [here](#).

- BIOE 5054 Regulatory Affairs (3 credits)
- BIOE 5420 Biomedical Device Design and Entrepreneurship (3 credits)
- One bioengineering elective class (3 credits)
- Entrepreneurship project (3 credits)

The Graduate Certificate in Assistive Technology and Inclusive Engineering

The Assistive Technology and Inclusive Engineering graduate certificate provides an in-depth introduction to the area of inclusive and assistive technologies for individuals aspiring to either work in the field of technology, disability, and/or aging into disability. The certificate is fifteen credits and is open to students inside and outside the university who have a BA or BS. A minimum 3.0 GPA is recommended. More information can be found [here](#).

Graduate Certificate in Neural Engineering

The graduate certificate in Neural Engineering provides students with an in depth introduction to cellular and systems neuroscience, neural interfaces, neuroimaging, and neurocomputation, preparing students to work in industry or academia. The certificate is twelve credits and is open to all graduates in engineering or neuroscience at CU Denver. More info. can be found [here](#).

Dual MS/MBA

To participate in the dual MS/MBA program, students must apply and be accepted to both degrees. Though coursework does not necessarily need to be taken for both degrees in a given semester, a student will remain enrolled in both programs until all requirements for both degrees are met. Degrees are conferred at the same time.

Dual MD-MS

Bioengineering offers the MS component of a dual MD/MS-Bioengineering. The School of Medicine manages all admissions to the MD program without input from Bioengineering. Further, matriculation in the BIOE-MS program first does not confer any admissions advantage to the MD program. Most dual degree candidates will take a leave of absence between their third and fourth years of medical school to complete their BIOE-MS requirements. The dual degree option is available to University of Colorado School of Medicine MD students who are in good standing and have the permission of the School of Medicine to pursue the dual degree. The MS requirements can be completed by a motivated student in three semesters (Summer, Fall, Spring) but may require additional time, depending on the student's course choices and research project. To meet the MS requirements of the dual MD/MS- BIOE, students must:

- Complete a modified BIOE core (14 credit hours) + 1-2 electives (3-6 credit hours. Please note that exact course numbers are subject to change):
- Complete BIOE 5020 and/or BIOE 5021 (Quantitative Core; 3-6 credit hours)
- Complete the Technology Core (6 credit hours)
- Complete BIOE 5040 – may satisfy the research ethics course requirement; (2 credit hours)
- Complete the elective requirement: any graduate-level class agreed to by the academic and/or research mentors
- Conduct research and produce a project or thesis under the mentorship of an approved faculty member and earn six credit hours of BIOE 6960 or 6950 (project or thesis hours).
- Establish a committee of at least two Graduate Faculty members to oversee the research and administer the final defense examination.
- Pass a final defense examination:
MD/MS students will count the following classes towards their life sciences and clinical experiences core requirements, in lieu of BIOE 5041, BIOE 5010 & 5011 or equivalent:
Molecules to Medicine
- Cardiovascular, Pulmonary and Renal Systems Nervous System. Digestion, Endocrine and Metabolic

Time Commitment

Bioengineering is a very rigorous program. Previous students report that a full course load often results in 40+ hours of class, homework and study time per week. Combined with research, graduate students can expect to spend upwards of 50-60 hours per week at their studies and research. In some cases, students may need to visit the lab on evenings and weekends, and even in the middle of the night or during holiday time.

Graduate school is rigorous and may demand 50-60+ hours per week!

Grad School Policy for Vacation & Leave (PhD)

Graduate school is a privilege; working in the biomedical research/academic field, whether as a graduate student, a postdoctoral fellow, or an independent investigator, is a time-honored and challenging profession that requires a high level of commitment and responsibility. Students who receive full-support stipends from CU Denver | Anschutz Medical Campus PhD programs are required to pursue their training on a full-time basis, devoting each day of the normal work week, plus any additional time required by their research projects and academic courses. Additionally, for a student to maintain full-time status, the following guidelines for vacation and leave time have been established by the Graduate School. These represent the leave to which a graduate student is entitled; however, research demands and commitment to graduate studies often result in students using less than the allotted leave. Individual graduate programs may not have a formalized system for accounting for vacation and sick leave; if so, vacation and leave monitoring falls under the honor system and is the responsibility of the student.

Vacation and Holidays

Graduate students receive all University holidays and no more than 14 calendar days (counting all days Monday through Sunday) of vacation per annum, with no year-to-year accrual. Students continue to receive stipends during vacations and holidays. In the Graduate School at CU Denver, the times between academic terms and the summers are considered active parts of the training period and are not necessarily free times. Students taking courses are expected to attend all classes and take all exams as scheduled. They should not take vacations when classes or exams are scheduled.

Sick Leave and Other Leave

Graduate students may continue to receive stipends for up to 15 calendar days (counting all days Monday through Sunday) of sick leave per annum, with no year-to-year accrual. Under exceptional circumstances, additional sick days may be granted following a written request and approval by the student's Program Director. Sick leave may be used for the medical conditions related to pregnancy and childbirth.

Parental Leave. Graduate students may also receive stipends for up to 60 calendar days (counting all days Monday through Sunday) of parental leave per annum for the adoption or the birth of a child.

Either parent is eligible for parental leave. Parental leave must be approved by the student's program director. Sick leave may not be used to supplement parental leave, except as noted above.

Unpaid Leave. Individuals requiring more than 15 calendar days of sick leave or more than 60 calendar days of parental leave, must seek approval from their program for an unpaid leave of absence. Approval for a leave of absence must be requested in advance by the student and approved by the program. The leave period and conditions must be documented, both at the time of leave and at the time of re-entry in the program. A copy of this agreement must be submitted to the Graduate School.

Termination. Upon graduation or termination a graduate student forfeits all unused annual and sick leave; payment may not be made from grant funds (training grants or research grants) for

leave not taken.

Funding, Tuition and Residency

Master's Students

The Department of Bioengineering does not have formal research assistantships for MS students. However, some students have been able to find mentors with research funding. Students may also be hired as teaching assistants or graders for undergraduate or graduate level courses. Job postings for such positions are usually distributed by the department 4-6 weeks prior to the start of the term.

Scholarship information is available at CU Denver's [Financial Aid](#) and [Scholarships Office](#). The Downtown Campus Financial Aid Office is located in the North Classroom Building on Auraria Campus. Their phone number is 303-315-5969.

Tuition & Fees

It is difficult to predict exactly how much a student will spend in tuition and fees in a given semester because not all students take the same number of classes. Students also find that some classes have additional instructional fees. During the academic year of 2021-2022, in-state graduate students in the Bioengineering program pay \$642 per credit hour; out-of-state graduate students pay \$1,416 per credit hours (subject to change each year).

Currently, Bioengineering graduate students pay Denver Campus tuition and Anschutz Medical Campus (AMC) fees. Please visit the [AMC Bursar's Office website](#) for more details about student fees.

PhD Students

All new PhD students are offered a stipend plus tuition, fees, and health insurance at the time of admission. Continued funding, however, is dependent on a number of factors including but not limited to mentor funding availability, successful grant applications, residency status, and satisfactory academic and research progress.

The PhD is a pathway to a career as an independent researcher and most of the available funding for research comes from public (NIH, NSF) and private research and philanthropic organizations. As part of the degree path, PhD students are strongly encouraged to write and apply for grants in their first year. This process prepares the student for success in early career funding and allows mentors to fund more students as their students start to fund themselves. Your mentor and the department's Grants Manager will provide grant-writing guidance.

The following list is not exhaustive, but should give you ideas of where to look for grant and fellowship opportunities. Each program is going to have its own application requirements, deadlines and review processes. However, many applications are due in fall for funding the following school year and review can often take 6-12 months.

Internal CU Denver Programs:

- Colorado Clinical and Translational Sciences Institute TL1 (T32) Predoctoral Fellowship
- Bioscience Discovery and Evaluation Grant Federal Government:

- National Defense Science and Engineering Graduate Fellowships
- NSF Graduate Research Fellowship
- NIH NRSA Predoctoral Fellowship (F31)
- NIH PA-12-149 Research Supplements to Promote Diversity in Health-Related
- NIH R36 Dissertation

Award

Other Organizations:

- Graduate Women in Science Fellowship
- American Heart Association
- Juvenile Diabetes Research Foundation
- American Association of University Women
- American Association of Cancer Research travel grants
- L'Oreal USA for Women in Science

Many professional organizations will have travel awards to support students who will be attending annual meetings to present research. In addition to award application deadlines, pay attention to abstract submission deadlines as well.

Travel Funding

The department does not have specific travel funds for graduate students. However, research mentors might have available funding for students to attend conferences. The Graduate School has small travel awards available, and often the professional associations that sponsor conferences have travel awards. Students are encouraged to explore all of the options.

Colorado Residency

Should you choose to join us for graduate studies, it is important that you begin to establish residency in Colorado before the start of the semester. Demonstrating your intent to make Colorado your permanent home (establishing “domicile”) requires more than living here. Key steps include (but are not limited to) obtaining a Colorado driver’s license, registering to vote in Colorado, registering your car in Colorado, and pay Colorado state income tax. You must petition for in-state status before the start of your second year, else you may be responsible for the difference between in-state and out-of-state tuition. Please visit the CU Anschutz Registrar’s Office for further detailed instructions on establishing residency and petitioning for a status change. **Funded PhD students may only be eligible for continued funding if Colorado residency is established prior to their second year in the program.** Please reach out to the [Residency Office](#) on the Downtown Campus for more information and direct any questions to residency@ucdenver.edu.

PhD Timeline Table, Year Three and Beyond

Students should use the below table to plan their Program of Study. The individual plans may differ from the one below, but all students must meet the preliminary and comprehensive examination deadlines in order to progress in the program.

	Pre-app			Year 1			Year 2			Year 3			Year 4		
	Fall	SPR	SU	Fall	SPR	SU	Fall	SPR	SU	Fall	SPR	SU	Fall	SPR	SU
Bioengineering Program Requirements	Note that only 10 dissertation credits should be taken before the semester of the Comprehensive exam. All post-comp PhDs must take 5 credits of dissertation in Fall and Spring and 1 credit in Summer until defense.														
Identify Funding & Advisor	X														
Application	X														
Admission Decision		X													
Core Classes (21 CR)				X	X										
Preliminary Exam						X									
Elective Classes (9 CR)							X	X							
Comprehensive Exam									X						
Dissertation (30 CR)							X	X		X	X	X	X		
Dissertation Defense														X	

Lab Rotation

At the discretion of the department and the admissions committee, some students may be admitted with the expectation that they rotate through laboratories for one or two semesters in order to choose a lab. Rotations would generally occur over the first semester with three required six-week rotations, but could last for two semesters with three required 12-week rotations at the discretion of the admissions committee. The students must complete all three rotations during the time specified in the offer letter. However, if students receive their own funding, from a grant or fellowship, they are no longer held to the rotations and the completion of rotations is at the discretion of the student and their advisor.

Additionally, the student will be assigned an advisor who is not a PI of one of the rotation laboratories. Any other changes to the offer letter stipulations must be approved by a vote of the Graduate Affairs Committee.

Year 1: Preliminary Examination

Each Bioengineering PhD Candidate will complete a PhD preliminary examination, typically during the spring or summer semester of their first year of study. The exam format will consist of three components: (1) oral and written presentation of the research topic; (2) oral and written presentation of the training pathway (coursework and timeline) to prepare the student for the research; (3) oral exam on undergraduate-level competencies in relevant topic areas. These sections are described in more detail below. Students are highly encouraged to discuss these items with their research advisor(s) and form the Preliminary Examination committee as early as possible, certainly no later than the middle of February. Students should schedule their examination several weeks ahead of time to ensure that all committee members are available on that date. All written exam materials (Research Plan and Training Plan) must be turned in to committee members at least two weeks prior to the exam date.

The Committee

The preliminary examination committee must consist of three faculty mentors including a primary mentor (additional committee members may be included but three is recommended). Note that this committee is not necessarily the same as the candidate's thesis committee. At least two committee members must be bioengineering department core faculty. If a candidate has a primary mentor who is only an affiliated bioengineering faculty, they additionally require a "primary" co-mentor who is core faculty and who must be identified prior to their preliminary exam. This core member insures that bioengineering-specific expectations are met for the duration of the thesis.

The Preliminary Exam consists of three parts:

Part 1: Research Plan

Candidates are expected to identify a relevant bioengineering research topic for their proposed thesis working closely with their research mentor(s). With the preliminary examination members identified, and with the help of the Research Methods class, the candidate should prepare a 30 minute presentation and associated written proposal (2-3 pages) covering the following topics:

1. Research goals and hypothesis: a brief ($\frac{1}{2}$ page) introductory summary narrative of the major goals of their proposed research, and the overall research hypothesis that drives these goals.
2. Background and Significance: a summary of relevant background material, gathered primarily from peer-reviewed journal articles, which support the research goals and hypothesis.

Given that the candidate's first year consists of mostly didactic training, this plan is expected to be fairly general in its detail, and does not need to include preliminary research results or detailed research methods and approach.

Part 2: Training Plan

Given the research topic proposed in the first part of the exam, the candidate will further create a 15 minute presentation and an associated 1 page written training plan that describes his/her career goals/objectives and the training activities to be undertaken for the rest of their PhD program. The second part of this plan could be broken down as descriptions of the following topics:

1. Formal didactic training: i.e. coursework and its contribution to the candidate's research area. This section should include a summary of previous coursework that is relevant and proposed coursework with a description of how these contribute to the candidate's graduate preparation. A table format is recommended for clarity.
2. Informal training: plans to attend local seminars / national meetings; a list of mentors, proposed meeting arrangements with them, and how these mentor interactions will contribute to the candidate's research; additional collaborations with (non-mentor) faculty, if any; lists of any informal classes such as animal handling or ethics; and any mentoring the candidate may provide to others.
3. Peer Review: plans for journal submissions, conference abstracts, and/or intramural/extramural grant applications.

Part 3: Background Knowledge

Finally, by mid-February of the Spring Semester the candidate must identify three fundamental knowledge areas appropriate for their proposed research and inform their mentors/committee of these areas. It is

recommended that one of these areas comprise the anatomy and physiology of the biological system being studied. For example, a candidate studying a new ultrasound imaging modality for blood flow might select acoustics, fluid dynamics, and cardiovascular anatomy & physiology, while a candidate studying orthopedic biomechanics might select mechanics and dynamics, materials, and musculoskeletal anatomy and physiology. The candidate will work with their faculty mentor and with their preliminary exam committee members to select material that they will use for preparation in these three broad knowledge areas such as textbooks, papers, book chapters, etc. The candidate will be expected to know this material in detail and answer questions on this material in the oral presentation. It is important to note that the expectation is for the student to demonstrate undergraduate-level competency in these knowledge areas as the student is not likely to have completed all the graduate course work in these topics before the preliminary exam. The goal is to ascertain fundamental knowledge and general ability to think through problems, not necessarily just memorization of equations.

The Preliminary Examination Committee will then make one of the following decisions:

1. Student has unconditionally passed the Preliminary Examination.
2. Student has conditionally passed the Preliminary Examination. Conditions that the student must fulfill must be provided to the student along with a date by which the student must do this.
3. Student has failed the Preliminary Examination. The committee may recommend that the student stand for the Preliminary Examination a second time (no student may take the Preliminary Examination more than twice) or may recommend that the student discontinue further PhD study.

Action steps for student:

- 1) Submit [Preliminary Exam Committee Proposal](#) to the Graduate Program Manager (a month in advanced is recommended) who will send to GAC for approval.
- 2) Once approved by GAC, reserve a room through EMS (or have the Program Manager create the zoom link) and submit a [Request for Exam](#) to the Graduate Program Manager. This should be done **at least two weeks prior** to the exam date. Program Director will sign for final approval.
 - Please allow one week for proposal to be reviewed by GAC
- 3) The Graduate Program Manager will submit Exam Report to the student's Chair prior to the exam date.

Dissertation Advisory Committee

By the end of the second Fall semester, students will need to establish their Dissertation Advisory Committee (DAC). The Dissertation Advisor will work with the student to select at least four other faculty members to serve on this committee. The purpose of the DAC is to advise the student and the Dissertation Advisor to ensure that the research and dissertation progress in a timely manner. Students will also likely choose their Comprehensive Examination and Dissertation Defense Committee members from the Dissertation Advisory Committee. The Committees can be the same.

The Chair of the DAC must be a bioengineering core faculty member and may not be the Dissertation Advisor. This will allow the DAC to provide more objective guidance to the student and their Dissertation Advisor. Two members must be BIOE core faculty.

Student must meet with their DAC twice per year following the preliminary examination. Failing to do so may negatively impact the overall progress. Every other meeting will correspond to a

public Methods & Research Seminar and may also correspond to planning the major examinations.

Graduate Faculty Appointments

In order to serve as a mentor or primary advisor, on a thesis or examination committee or as a program or course director, a faculty member must be appointed to the faculty of the Graduate School ("Graduate Faculty"). The Graduate Faculty is comprised of individuals who have been nominated by a graduate program on the basis of their research and scholarship, mentoring or teaching, and who demonstrate a commitment to graduate education and students. The Graduate School maintains a directory of Graduate Faculty on their [website](#). Please consult the list and work with the Graduate Program Manager to ensure that all of your committee members have current Graduate Faculty appointments. Please note that Bioengineering may nominate industry partners or researchers from other institutions for special appointments, if necessary.

Years 2-3: Comprehensive Examination

Sometime during the end of the second or third years in the Bioengineering PhD program, students will take their second major examination: the comprehensive examination. Details about this exam can be found in the [Comprehensive Examination Document](#).

The comprehensive (comp) exam is a major stepping-stone for PhD students. This exam must be taken by the end of the third year. The first part of the exam is an open seminar (45 minutes), followed by a closed-door portion (one-two hours) with the exam committee. Once students pass the exam they will be admitted to candidacy and officially become a PhD Candidate. Before taking the comp exam, students must complete all of the didactic coursework (30 credit hours) and have made progress on their research (as determined by the DAC). It is recommended by the Graduate School that students earn no more than ten credits of dissertation prior to the semester they take their comp exam. Some advisors and committees will have specific requirements, but generally, students should have produced at least preliminary data by this point, have a clear plan for the remainder of their research, and some sense of where to publish and present.

The Comprehensive Examination Committee must consist of at least four members of the Graduate Faculty. These members may be the same or different from the DAC members. The Comprehensive Exam Committee Chair must be a bioengineering core faculty member and may not be the Dissertation Advisor.

The Graduate School is responsible for documenting the comprehensive exam, and all forms must be submitted to the Graduate School at least two weeks prior to the comprehensive exam date.

Action steps for student:

- 1) Work with your committee to reserve a day and time that works for everyone to do your exam. Create the zoom link. If in-person, work with the Program Manager to reserve a room.
- 2) Submit completed [Application for Candidacy](#) and [Request for Exam](#) forms to Graduate Program Manager. PM will send to Program Director for departmental approval, and send to the Graduate School.
- 3) The Graduate School will generate an exam report form to the Committee Chair.

Years 4-5: The Defense Exam & Graduation

The defense exam is the last major milestone and there are several important deadlines to consider that precede the defense. The defense exam will begin much like the comprehensive exam, with an open seminar about 45-55 minutes in length. This seminar should focus entirely on the research, followed by a closed-door exam by the defense committee.

The final defense committee may be the same as or include different members from the DAC. At least five members of the committee must hold Graduate Faculty appointments and the Committee Chair must be a member of the bioengineering core faculty, but not the Dissertation Advisor. One member must not be a core BIOE faculty member. Please see the earlier section on Graduate Faculty appointments for more information.

Besides the defense exam, students must complete the following items to graduate. Please see the [Graduate School website](#) for more details about the deadlines.

1. Apply for graduation on UCDAccess
2. Submit dissertation for format review to the Graduate School at STEPHANIE.PUELLO@UCDENVER.EDU.
3. Include the [Declaration of Original Work statement](#) at the beginning of thesis. For any questions on this form, contact the Graduate Program Manager.
4. Submit [Request for Examination](#) **at least two weeks before the exam** to the Graduate School
5. Defend (make sure to bring the Thesis Approval form to the defense exam)
6. Submit [Thesis Approval](#) form to the Graduate School
7. Submit final thesis/dissertation to ProQuest

Missing any of these deadlines could result in delay of graduation. There are no exceptions made to the graduation deadline so please plan accordingly.

Publication Guidelines

As publications are the currency of research, students are strongly encouraged to publish their work. Each Dissertation Advisor will set their own requirements, but a typical dissertation will result in at least one first-author, peer-reviewed journal article. For many students, the first publication may come in the form of a literature review that will also serve as the introduction to the dissertation. By the comprehensive exam, students should have a good idea what their publications will be; ideally they should have already submitted one.

Time Limit for PhD Completion

Doctoral students, whether enrolled full-time or part-time, must complete all degree requirements within eight years of matriculation. Students who fail to complete the degree in this eight-year period are subject to termination from the Graduate School upon the recommendation of the Program Director and concurrence of the Dean. For a student to continue beyond the prescribed time limit, the Program Director must petition to the Dean for an extension and include (1) reasons why the program faculty believes the student should be allowed to continue in the program and (2) an anticipated timeline for completion of the degree.

Normally, extensions for time to degree are for one year or less, but under rare circumstances, a second extension may be requested. Complete the Graduate School's [Extension of Time Limit form](#). Approved leaves of absence do not automatically extend the time limits for earning a degree, but they may be used as a reason to request an extension, if needed.

Policy on Change of Academic Advisor

Applicability

This policy applies when graduate students in the Department of Bioengineering PhD program change advisors during their degree program. This policy does not apply when a student completes a degree with one advisor and then starts a new degree with another advisor. This policy does not apply if the change is forced by extreme circumstances, such as the advisor leaving the Bioengineering graduate faculty.

Rationale

Graduate students in the bioengineering PhD program may have personal or professional reasons for needing to change advisors during their degree program. This policy ensures a fair process to both the student and their advisor.

Rules for changing advisors:

1. In general, the student will initiate advisor changes by submitting a petition to the Graduate Affairs Committee (GAC) requesting the change and detailing the new research advisor.
2. If a faculty member wishes to cease serving as advisor to a particular student, he or she must petition the GAC, who will decide to approve or deny the change. The advisor must include an explanation of the reasons for the change along with supporting documentation.
 - a. For changes initiated due to poor student performance in the research environment, the advisor must provide documentation of meetings with the student and evidence of poor performance covering at least three months of observation.
 - b. For changes due to lack of advisor funds for the student stipend and tuition, the advisor should provide documentation of laboratory funding. Because funding difficulties are often predictable months ahead of time, the advisor should contact the committee at least 4 months before the end of funding to attempt to find other possible solutions. The GAC expects advisors to prioritize graduate student funding over teaching buy-downs, summer salary, technician salary and postdoc salary. In these cases, the GAC can choose to limit or prevent the PI from advising future students in the Bioengineering department.
 - c. Changes initiated due to research misconduct, plagiarism, or a blatant breach of ethics, safety, or university policies do not need to have 3 months of documentation and can be initiated immediately. The GAC can then decide

- d. whether to allow a lab change or to remove the student from the program.
3. Students may approach a prospective advisor to inquire whether they would be accepted as a student if they do switch laboratories. A prospective advisor is not obliged to inform the student's current advisor. The prospective advisor should consult the Graduate Affairs Committee about funding and stipend levels prior to accepting the student into their lab.
4. The student must inform his/her current advisor of intention to change advisors. The students may do this either before approaching prospective advisors or within one working day after accepting a position with a new advisor.
5. It is the responsibility of the student to inform the Graduate Program Manager when they have changed advisors. The Graduate Program Manager will process the documents necessary to comply with university records. Within three weeks of changing advisors, the student must schedule a meeting with the Graduate Affairs Committee and the new advisor to work out a revised timetable for procedural requirements (e.g., course of study, proposal, comprehensive exam, etc., as appropriate). The timetable for the Ph.D. qualifying or comprehensive exam may be adjusted to accommodate the change in project focus.
6. Note that many offers of student support are conditional upon the student working in a particular research area or for a particular advisor; when a student changes advisors, the original offer becomes void. The new advisor and the Graduate Affairs Committee will provide a new offer of student support according to Graduate School Rules.

Master's Program Milestones

MS Timeline Table

Students should use the below table to plan their Program of Study. The individual plans may differ from the one below, but this shows students how to graduate in two years.

	Pre-app			Year 1			Year 2		
	Fall	SPR	SU	Fall	SPR	SU	Fall	SPR	SU
Bioengineering Program Requirements	MS students may choose to spread their core classes out over both years to ease the load, particularly if they are going to start research right away. However, doing core in Year 1 leaves more time for research in Year 2.								
Application	X								
Admission Decision		X							
Core Classes (21 CR)				X	X		X	X	
Identify a project/thesis mentor & project					X				
Elective Classes (3-6 CR)							X	X	
Project/Thesis (3-6 CR)							X	X	
Defense								X	

Choosing Academic Advisor

Each incoming Bioengineering student is assigned an Academic Advisor from the Bioengineering core faculty. This faculty member may also be your project/thesis advisor; alternatively, he/she

will help you identify a project/thesis advisor.

Choosing Your Project/Thesis

MS students have the choice between a Master's project and a Master's thesis.

The **Master's thesis** is a traditional academic document. If the work results in a peer-reviewed publication, students are likely doing a thesis. Master's theses are subject to the same formatting guidelines as doctoral dissertations and must be filed with the Graduate School. Master's theses are acknowledged on the final transcript with the inclusion of thesis title, whereas Master's projects are not. For this reason, doing a thesis is usually more beneficial to the student because the research gets recognition and because a thesis-based masters has more uniform expectations between universities and is more highly regarded.

Note that the mentor and student may choose to embargo publication of the thesis for up to 1 year to allow for publication of the research or patent filing.

Students who do a thesis must register for at least three credits (and no more than six credits) of BIOE 6950 during their studies. Students will receive a grade of "IP" (in progress) until their final defense. Contact Graduate Program Manager for more details.

For projects where open publication of the final document is not appropriate or desired, such as projects with an industry partner or projects involving product designs, product testing, regulatory and policy review, market analysis, business plans, and patent applications, a **Master's project** may be more appropriate. Master's projects are not published, the project defense is not public, and the title of the project is not acknowledged on the transcript or degree. However, the Master's project has the same requirements for the scope of the work, depth and professionalism of the written report, and must also be defended in front of a committee of at least 3 faculty (2 of whom are BIOE core faculty).

If doing a Master's project, students must register for at least three (and no more than six) credits of BIOE 6960 during their studies. Students will receive a grade of "IP" (in progress) until their final defense.

All students must have a project and Research Mentor and thesis (or project) title declared by the end of their first semester in the program. If the research mentor is not a Bioengineering core faculty, then the student must also choose a Bioengineering core faculty member as their advisor and the chair of the defense exam committee. Please work with your Academic Advisor and/or Program Manager if you're having trouble. Once decided, please complete the form [here](#).

Choosing Exam Committee

Students should choose their committee by the end of their first year and have at least one or two meetings prior to their defense. The final defense committee must consist of at least three Graduate Faculty members, two of whom must be part of the Bioengineering Core Faculty. The Committee's Chair must be a Bioengineering core faculty member. The research advisor may also serve as the committee's chair. Use the [Committee Planning Form](#) to help you with this important task.

If students choose to work on a project with an industry partner, their Industry Advisor may not already have a Graduate Faculty appointment; please work with Graduate Program Manager to seek such an appointment. Alternatively, students may have three Graduate Faculty members plus the Industry Advisor.

Years 2-3: Final Defense Exam

All MS students must take the final defense exam. However, there are several important deadlines to consider that precede the defense. Please find the specific dates of these deadlines on the Graduate School's website.

1. Apply for graduation on UCDAccess by Census Date
2. Submit [Request for Examination](#) to the Graduate Program Manager **at least two weeks** before the exam. Include a photo to be used in the announcement to the department. Submit your project/thesis to your committee. Your committee is in charge of the format review.
3. Defend (make sure to bring the [Thesis Approval](#) form to the defense exam if doing a thesis)
4. Submit Thesis Approval form to the Graduate Program Manager (if doing a thesis)
5. Include the [Declaration of Work statement](#) at the beginning of thesis. For any questions on this form, contact the Graduate Program Manager.
8. Once approved, submit final thesis to [ProQuest](#) or final project to Graduate Program Manager

Missing any of these deadlines results in delay of graduation. There are no exceptions made to the graduation deadline so please plan accordingly.

Your defense exam will begin much like a PhD comprehensive or defense examination, with an open seminar about 45 minutes in length. This seminar should focus entirely on your research. Plan on one hour of closed-door examination by your Master's committee.

Publication Guidelines

As publications are the currency of research, you're strongly encouraged to publish your work. It is not unusual for a Master's Thesis to result in one or more first-author, peer-reviewed journal articles. Talk with your advisor about your career plans and your desire to publish.

Time Limit for Master's Completion

Master's students, whether enrolled full-time or part-time, have seven years from their first semester to complete all degree requirements, including filing the thesis with the Graduate School, if required.

Students who fail to complete the degree in this seven-year period are subject to termination from the Graduate School upon recommendation from the Department Chair and concurrence of the Dean.

For a student to continue beyond the prescribed time limit, the Department Chair must petition to the Dean for an extension and include (1) reasons why the program faculty believes the student should be allowed to continue in the program and (2) an anticipated timeline for completion of the degree.

Normally, extensions for time to degree are for one year or less, but under rare circumstances, a second extension may be requested. Students need to complete the Graduate School's [Extension of Time Limit form](#). Approved leaves of absence do not automatically extend the time limits for earning a degree, but they may be used as a reason to request an extension, if needed.

Students who were previously admitted to a Graduate Program but who did not complete that degree program and who have not been registered for more than one (1) year [i.e., three (3) terms] at CU Denver | Anschutz must reapply to the Program supplying updated information and academic credentials. The following requirements must be satisfied before being readmitted:

- clarify their status with the Graduate Program and Graduate School to determine their eligibility to return and pursue the same degree;
- submit an application at least two weeks prior to the first day of the term in which you are interested in taking a course; and
- meet any new admission requirements required of matriculants (i.e., background checks, immunizations, etc.)

However, the Program is under no obligation to readmit the student, and the student should consult with the Program Director before applying here [University of Colorado Graduate Readmit Application \(ucdenver.edu\)](#).

Continuing from the MS to the PhD

The MS in BIOE is a great stepping stone to a PhD in Bioengineering at CU Denver or elsewhere. Here are some important things to know:

1. Students should have identified a mentor with whom they will be studying for their PhD. This person must have guaranteed funding for a PhD student and may or may not be their MS advisor.
2. Students will need to apply to the PhD program following the standard application process. Students will probably do this during their second year of the MS. Please note that the PhD application window closes on **December 1** for all applicants.
3. Students may apply for certain pre-doctoral fellowships while they are finishing the MS so that funding is available for the PhD.

Graduate Student Commencement Policy

Bioengineering students participate in the commencement ceremony on the Anschutz Medical Campus only. The medical campus has two ceremonies, one in May and one in December.

Students can only participate in commencement and be hooded if they have successfully defended their dissertation or thesis.

In order to be listed in the medical campus' program, you must [apply to graduate](#) and let the Graduate Program Manager know that you intend to graduate. Bioengineering graduate student diplomas will list both the University of Colorado Denver and University of Colorado Anschutz Medical Campus.

Directory of Services

Anschutz Medical Campus Badging Office

Phone: 303.724.0399 · Email: Security.BadgeOffice@ucdenver.edu · Office: Fitzsimons Building First Floor

Go to for: badge replacements, badge holders

Anschutz Medical Campus Parking Office

Phone: 303.724.2555 · Email: security.badgeoffice@cuanschutz.edu · Office: Fitzsimons Building First Floor, west side of the Food Court seating area)

Go to for: parking permits, parking tickets, RTD pass questions

Anschutz Medical Campus University Police Department

Phone: 303.724.4444 (police dispatch or non-emergencies) or 911 · Office: Anschutz Medical Campus Building 407 (University Police) 12454 East 19th Place

Go to for: campus security, lock-out problems

CARE Team

Phone: 303.315.7312 (Denver) 303.724.2866 (Anschutz)

Go to for: health and safety concerns

Student Health Insurance Office

Phone: 303.837.2127 · Email: studentinsurance@cuanschutz.edu · Office: Ed 2 North #3200

Go to for: all things student health insurance

Office of Campus Student Services, Anschutz Medical Campus

Phone: 303.724.2866 · Email: StudentAffairs@cuanschutz.edu · Office: Ed 2 North #3200

Go to for: university resources

Campus Mental Health Resources

Phone: 303.724.5000 · Email: info@cuanschutz.edu · Office: Fitzsimons Building

Go to for: campus services available to help with everyday stressors

Department Directory

Bioengineering Staff

Karen Gilbert, Grants Manager

Phone: 303.724.7296 · Email: karen.gilbert@cuanschutz.edu · Office: Y18-1007

Go to for: Routing your grant, grants information

Kate Hoch, Department Administrator for Finance and Administration

Phone: 303.724.6280 · Email: kate.hoch@cuanschutz.edu · Office: Y18-1307D

Go to for: budget, spending, human resources, faculty concerns, concerns with faculty

Natalie Kersten, Graduate Program Manager

Phone: 303.724.9972 · Email: natalie.kersten@cuanschutz.edu · Office: Y18-1307B

Go to for: all things graduate program, marketing ideas, social media, AMC badges

Shaun Boulier, Undergraduate Program Manager

DC Phone: 303.556.5838 · Email: shaun.boulier@cuanschutz.edu · DC Office: North Classroom 2516B

Go to for: undergraduate admissions and curriculum information, advising, student services, support for undergraduates, DDC badges, FCQs

Bioengineering Faculty

Dr. Keith Neeves, Professor and Interim Department Chair

Phone: 303.724.3344 · Email: keith.neeves@cuanschutz.edu · Office: RC2 Room 9006

Go to for: feedback on program, significant grievances hematology questions, oncology questions

Dr. Jeffrey Jacot, Associate Professor and Graduate Program Director

Phone: 303-724-8696 · Email: jeffrey.jacot@cuanschutz.edu · Office: Y18-1307M

Go to for: tissue engineering questions, department seminars, admissions questions

Dr. Richard KP Benninger, Associate Professor

Phone: 303.724.6388 · Email: richard.benninger@cuanschutz.edu · Office: Barbara Davis Center 4306-D

Go to for: imaging questions, tech questions, diabetes questions, rotation questions, curriculum concerns

Dr. Cathy Bodine, Associate Professor

Phone: 303.315.1281 · Email: cathy.bodine@cuanschutz.edu · Office: Assistive Technology Partners 601 East 18th Avenue, Suit 130, Denver CO 80203

Go to for: assistive technology questions, rehabilitation questions

Dr. Emily Gibson, Associate Professor

Phone: 303.724.3678 · Email: emily.gibson@cuanschutz.edu · Office: RC2 8112

Go to for: quantitative questions, imaging questions, cellular biophysics questions

Dr. Kendall Hunter, Associate Professor

Phone: 303.724.4197 · Email: kendall.hunter@cuanschutz.edu · Office: RC2 6018

Go to for: quantitative modeling questions, admissions questions

Dr. Steve Lammers, Instructor

Phone: 303-724-9549 Email: steve.lammers@cuanschutz.edu Office: Y18 1307G

Go to Steve for: Bioprinting questions, design project questions

Dr. Chelsea Magin, Assistant Professor

Phone: 303.724.3344 · Email: chelsea.magin@cuanschutz.edu · Office: RC2 Room 9006

Go to for: regulatory affairs questions, pulmonary engineering questions

Dr. Keith Neeves, Professor

Phone: 303.724.3344 · Email: keith.neeves@cuanschutz.edu · Office: RC2 Room 9006

Go to for: hematology questions, oncology questions

Dr. Daewon Park, Associate Professor

Phone: 303.724.6947 · Email: daewon.park@cuanschutz.edu · Office: RC1 North 4118

Go to for: polymer questions, drug delivery questions, Graduate Committee questions

Dr. Brisa Pena, Research Assistant Professor

Phone: 303-724-1113 · Email: brisa.penacastellanos@cuanschutz.edu · Office: BS3, #121

Go to for: Material Science, Atomic Force Microscopy, Cardiac Tissue Engineering and miRNA delivery.

Dr. Bradford Smith, Assistant Professor

Phone: 303.724.0137 · Email: Bradford.smith@cuanschutz.edu · Office: RC2 6015

Go to for: pulmonary questions, independent study and research project questions

Dr. Richard Weir, Associate Research Professor

Cell: 847.912.1032 · Email: richard.weir@cuanschutz.edu · Office: Y18-1307H

Go to for: prosthetic questions, 3D printing questions