

Graduate Programs in Biostatistics

2025-2026

Student and Advisor Handbook

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Policy Regarding Changes to the Handbook

This handbook complements the policies of the Graduate School. It includes information specific to the Colorado School of Public Health and the Biostatistics MS and PhD Graduate Programs. Please retain it for reference on academic policies, thesis, graduation, and other topics. Students are bound by handbook rules corresponding to the year of joining the program. This handbook was accurate and up to date when printed in August 2024. It does not constitute a contract with the University of Colorado Denver, either expressed or implied. The Graduate School and the Biostatistics Graduate Programs reserve the right at any time to change, delete, or add to any of the provisions at their discretion. Furthermore, the provisions of this document are designed to serve as firm guidelines rather than absolute rules, and exceptions may be made on the basis of extenuating circumstances.

Websites

School Site:

<https://coloradosph.cuanschutz.edu/>

Program Site:

<https://coloradosph.cuanschutz.edu/education/departments/biostatistics-informatics>

ColoradoSPH Academic and Student Affairs Resources:

<https://coloradosph.cuanschutz.edu/resources/for-current-students>

Graduate School Policies and Resources:

<https://graduateschool.cuanschutz.edu/>

Message from the Associate Dean for Academic and Student Affairs



Welcome to the Colorado School of Public Health!

It is with great pleasure that I welcome you as the newest members of our academic community. Your decision to join us marks the beginning of an exciting and impactful journey. Throughout this journey we will rise together to reimagine public health, champion health for all, and build a healthier future through education, research, and community partnership.

We are a collaborative School dedicated to fostering an environment where you can thrive both academically and personally. Here, you will have access to innovative learning opportunities, cutting-edge research, and a supportive network committed to your success. Throughout your time with us, you will engage in rigorous coursework, collaborate on meaningful projects, and develop the skills necessary to address some of the most pressing health challenges of our time.

I encourage you to take full advantage of the resources and opportunities available to you. Participate in research projects, join student organizations, attend seminars and workshops, and seek out mentorship and networking opportunities. These experiences will not only enhance your education but also help you build a strong foundation for your future career in public health.

As you embark on this new chapter, remember that you are not alone. We are here to support you every step of the way. Together, we will work towards a healthier, more equitable future for all.

Once again, welcome to the School of Public Health. We are thrilled to have you with us and look forward to witnessing all that you will achieve.

Sincerely,

A handwritten signature in blue ink that reads "Madiha Abdel-Maksoud". The signature is written in a cursive, flowing style.

Madiha Abdel-Maksoud, MD, PhD, MSPH
Associate Dean for Academic and Student Affairs

Colorado School of Public Health

Overview

The Colorado School of Public Health is a collaborative institution formed by the University of Colorado, Colorado State University, and the University of Northern Colorado. As the first and only school of public health in the nine-state Rocky Mountain West, we are uniquely positioned to lead in education, research, and community engagement.

From emerging infectious diseases and chronic conditions to environmental challenges and social barriers of health, our communities face complex and evolving public health issues. ColoradoSPH prepares a dynamic and practice-ready public health workforce equipped with the knowledge, skills, and values to meet these challenges. With more than 200 faculty across three campuses, our experts are advancing science and solutions that improve the lives of individuals and communities locally, nationally, and globally across every stage of life

Vision Statement

Public Health Elevated. Rising Together for a Healthier Future for All

Mission Statement

Reimagine Public Health Education As a premier school for public health leaders and workforce, we create a dynamic and engaging educational experience that prepares students to partner with an array of communities and populations to address the most daunting public health problems.

Pursue & Champion Health for All We are resilient in our pursuit of health for all people. Our dedication ensures that every individual can achieve optimal health.

Centered in Science, Proven in Practice Our signature approach merges scientific research with practical application. By grounding our work in evidence-based methodologies, we translate academic insights into tangible health improvements.

Connect to Community, Build Partnerships for a Healthier Future At the heart of our mission are strong community connections and partnerships. We are indispensable to our partners and promote innovation that lays the foundation for thriving, healthier communities in all public health communities.

Uplift & Empower Our Community to Thrive Our faculty, staff, and students are the foundation of our entire organization. We recognize their individual strengths, champion their growth, and foster a sense of belonging among all members of our school community. We create an environment where our people thrive so that they can help others to thrive.

Accreditation

The Colorado School of Public Health, established in 2008 as the first accredited school of public health in the Rocky Mountain West, is a collaborative effort among the University of Colorado, Colorado State University, and the University of Northern Colorado. Accredited by the Council on Education for Public Health (CEPH) since 2010 and re-accredited in 2024 through 2031, the school is committed to training and supporting a skilled public health workforce across Colorado and the region. Our accreditation

reflects our mission to advance public health through education, research, and community engagement.

Administration

University Leadership & Academic Partners

Donald M. Elliman Jr.
Chancellor, University of Colorado Anschutz Medical
Campus

Andrew Feinstein, PhD
President, University of Northern Colorado

Amy Parsons, JD
President, Colorado State University

Colorado School of Public Health Leadership

Cathy Bradley, PhD
Dean

Dana Dabelea, MD, PhD
Associate Dean for Research

Madiha Abdel-Maksoud, MD, PhD
Associate Dean for Academic and Student Affairs

Ned Calonge, MD, MPH
Associate Dean for Public Health Practice

Sam MaWhinney, ScD
Associate Dean for Faculty Affairs

Patricia Valverde, PhD
Director
University of Northern Colorado

Christine Gillen, MS
Associate Dean for Finance and Administration

Tracy Nelson, PhD, MPH
Director
Colorado State University

Cerise Hunt, PhD, MSW
Associate Dean for Leadership Excellence

Michelle Kuba, MPH
Assistant Dean of Operations

Department Chairs

Elizabeth Carlton, PhD
Chair, Environmental and Occupational Health

Jill Norris, PhD, MPH
Chair, Epidemiology

Jenn Leiferman, PhD
Chair, Community and Behavioral Health

Glen Mays, PhD
Chair, Health Systems, Management & Policy

Nichole Carlson, PhD
Interim Chair, Biostatistics and Informatics

Colorado School of Public Health Staff

Laura Hager
Director for Admissions & Students Affairs

Katie Guthmiller, MPH
Recruitment & Outreach Program Manager

Katherine Brumfield, MA
Career Services Manager

Dana Dolecki
Executive Assistant to the Dean

Christina Abel
Director of Communications & Alumni Relations

Brenda Witt
Academic Affairs Program Manager

Kayla Gray
Employment Lifecycle Principle Professional

Thuy Nguyen, MPS
Assistant Director of Employment Lifecycle & Payroll

Rhonda Truesdale, MA
Director of Human Resources and Employee Well-
being

Amanda Showalter, MHR
HR/Faculty Affairs Senior Professional

Graduate School

Jennifer Richer, PhD Dean	Catherine Wilson, EdD Assistant Dean
Bruce Mandt, PhD Associate Dean and Director PostDoc Office & Career Development Office	Maddie Parker, MA Academic Services Program Manager
Kathryn Wennertstrom Director, Finance and Accounting	

Contact Information		
Name:	Phone Number	Room
ColoradoSPH Office of Academic & Student Affairs	303-724-4613	Fitzsimons Bldg , Rm E3360
Carsten Görg (Program Co-Director)	303-724-3355	Fitzsimons Bldg , Rm W4131
Brandie Wagner (Program Co-Director)	303-724-4478	Fitzsimons Bldg , Rm, W4136
Brenda Witt (Academic Affairs Specialist)		Fitzsimons Bldg , Rm E3300
Rocío Vélez-Pesante (Program Administrator)		Fitzsimons Bldg , Rm W4124
Campus Office:	Phone Number	Room
Bookstore	303-724-2665	Ed 2 S, 1st Fl
Bursar's Office	303-556-2710	Ed2 N, 3rd Fl
Campus Information	303-724-6245	
CU Online Help Desk (Canvas)	303-315-3700	
Disability, Access, and Inclusion	303-724-8428	Hlth Sciences Lib, V23-1409A1
Health Sciences Library	303-724-2152	12950 E. Montview Blvd.
Financial Aid Office	303-724-8039	Ed2 N, 3rd Fl
Graduate School	303-724-2915	Fitzsimons Bldg, 5 th Floor
Ombuds		
(Counseling Services/Conflict Resolution)	303-724-2950	Fitzsimons Bldg , Rm C7005
Parking	303-724-2555	Fitzsimons Bldg , 1st Fl West
Payroll	303-735-6500	Boulder Campus
Registrar	303 724-8059	Ed2 N, 3rd Fl
Student Assistance Office	303-724-7686	Ed2 N, 3rd Fl

General Information

Facilities

Research and study opportunities are enhanced through the various resources available to students, including: student computing labs (Ed1 CTL P26-1501, Ed2 N CTL P28-2201 & RC1 N CTL P18-1309) and student rooms in the Education 1, Education 2, and the Research 1 North Buildings. The library also renovated the 2nd floor and has several study spaces, study rooms and nap pods, some of which can be reserved.

Student Mailboxes

Student mailboxes are used to send important information to students and should be checked on a regular basis. The student mailboxes are located on the 3rd Floor of the Fitzsimons Bldg to the left of the main elevators.

Scheduling Rooms for Meetings or Defense

To schedule the conference rooms (Ward Darley, Teleconference Room, or Dean's Conference Room) on the 3rd or 4th floors of the Fitzsimons Building or another room at the Anschutz Medical Campus for a committee meeting or defense, please contact the B&I Team using the [B&I Request Form](#)

Program Library

Statistics books, theses/research papers, and dissertations are available to check out. The Biostatistics and Informatics library is located in the Department space on 4th floor, Fitzsimons Bldg.

Biostatistics Seminars and Working Groups

Biostatistics department seminars feature students, faculty, or outside speakers. The days and times will be announced early in the semester, but have been Wednesdays at 12:00. There are also special topics working groups (Genomics, Causal Analysis, etc.) that meet monthly. *All students are encouraged to attend these activities.* Please watch for email announcements and check the events webpage.

<https://coloradosph.cuanschutz.edu/education/departments/biostatistics-informatics/events>

Accommodations for Disability: Virtual and In-Class

University of Colorado Anschutz is committed to providing equitable access to learning opportunities to students with documented disabilities (e.g., mental health, attentional, learning, chronic health, sensory, or physical). To ensure access to this class, and program, please contact the Office of Disability, Access, and Inclusion (disabilityaccess@cuanschutz.edu) for disability services to engage in a confidential conversation about the process for requesting reasonable accommodations in the classroom and clinical settings.

Accommodations are not provided retroactively. Students are encouraged to register with Disability Resources and Services as soon as they begin their program. The Colorado School of Public Health encourages students to access all resources available through Disability Resources and Services for consistent support and access to their programs. More information can be found online at:

<https://www.cuanschutz.edu/offices/office-of-disability-access-and-inclusion>

Academic Policies

Family Educational Rights and Privacy (FERPA)

Purpose of FERPA

FERPA deals specifically with the education records of students, affording them certain rights with respect to those records. For purposes of definition, education records are those records, which are:

1. Directly related to a student and,
2. Maintained by an institution or a party acting for the institution.

FERPA gives students who reach the age of 18 or who attend a post-secondary institution the right to inspect and review their own education records. Furthermore, the right to request amendment of records and to have some control over the disclosure of personally identifiable information from these records, shift from the parent to the students at this time.

FERPA applies to the education records of persons who are or have been in attendance in post-secondary institutions, including students in cooperative and correspondence study programs, video conference, satellite, internet or other electronic forms. FERPA does not apply to records of applicants for admission who are denied acceptance or, if accepted, do not attend an institution.

Directory Information

FERPA directory information is information contained in your education record that generally would not be considered harmful or an invasion of privacy if disclosed. Under current CU Denver | Anschutz policy, the following information is designated as directory information:

1. name
2. address, telephone number, and email address
3. dates of attendance
4. registration status
5. class
6. major
7. awards
8. honors
9. degrees conferred
10. photos

Although these items are designated by CU Denver | Anschutz as directory information, only a limited amount of this information is routinely disclosed by CU Denver | Anschutz officials and the University retains the discretion to refuse to disclose directory information if it believes such disclosure would be an infringement of your privacy rights.

Nondisclosure of Directory Information

Students may ask the University not to publicly disclose directory information. Please note, however, that if you are seeking employment, the Registrar's Office cannot release your enrollment, degree status or major to anyone unless you come to the Registrar's Office with a photo ID.

Forms to prevent disclosure of directory information can be obtained at The Anschutz Medical Campus Registrar's Office or via the Registrar's website at: <https://www.cuanschutz.edu/registrar/student-resources/forms>

Questions regarding your rights under FERPA should be directed to the Registrar's Office:

Anschutz Medical Campus:

Phone: 303-724-8059

Fax: 303-724-8060

Email: Registrar@CUAnschutz.edu

For additional information regarding FERPA, please visit the complete policy on the Registrar's website at:

<https://www.cuanschutz.edu/registrar/student-resources/ferpa>

Immunization Policy

To ensure that a minimum standard of public health and safety is provided for our faculty, students, and community all students matriculating into any ColoradoSPH program are required to provide proof immunizations in accordance with University of Colorado Anschutz campus policy: [7014a---student-immunization-requirements-and-compliance.pdf](#). According to this policy, all students must provide proof of the following immunizations: measles, mumps, rubella, tuberculosis, varicella, hepatitis B, polio, influenza and the Tdap series (tetanus, diphtheria and pertussis). Colorado School of Public Health utilizes the third party immunization verification system [CastleBranch](#). Students who do not submit immunization records at the specified time may experience a hold on future registration and/or be administratively withdrawn from classes until proof of immunizations has been received.

Health Insurance Requirement

Full-time students (definition of full-time for health insurance purposes varies from campus to campus) are required to have a university student health insurance plan unless proof of comparable coverage can be verified. Students are required to have insurance at their home campus only. If a student wishes to waive the insurance requirement due to comparable personal coverage, they may do so by petitioning the student health office at their home campus. Students at the Anschutz Medical Campus enrolled in one or more credit hours are required to have health insurance. Please check with the student health office for more information: <https://www.cuanschutz.edu/student/health-wellness/student-health-insurance>

Background Check Policy

Students matriculating into any ColoradoSPH program (including non-degree) are required to pass a criminal background investigation. The background check is conducted during the admissions process through CastleBranch. Students are required to pay a non-refundable processing fee for conducting the background check. Students who work at the university also need to submit the processing fee and complete the student background check, as additional criteria are specified beyond that required for employment. This must be completed before course registration can begin.

Student Academic Honor and Conduct Code

Education at the Colorado School of Public Health (ColoradoSPH) is conducted under the honor system. Matriculation at ColoradoSPH implies the acceptance of, and adherence to, the ColoradoSPH Student Academic Honor and Conduct Code. All students who have entered graduate and health professional programs should have developed the qualities of honesty and integrity, and each student should apply these principles to his or her academic and subsequent professional career. All students are expected also to have achieved a level of maturity always reflected by appropriate conduct.

Although it is not possible to list every situation that violates the ColoradoSPH Student Academic Honor and Conduct Code, the following examples provide a frame of reference.

1. Academic Honesty

Students should adhere to the highest standards of academic honesty and integrity. Examples of behavior that violate these standards include, but are not limited to: plagiarism (including the undocumented or improperly documented use of internet and web-based information), cheating, copying solutions from solutions manuals or from tutors, and using it as your own work, citing references not used in your work, illegitimate possession and/or use of examinations, unlawful use of AI, violation of the ethical standards for conducting research, and falsification of official records.

2. Professional Conduct

As future health professionals, students should also adhere to the highest standards of professionalism. Examples of unprofessional conduct include misrepresentation of effort, credentials, or achievement in either the academic or professional setting; any action that compromises the quality or safety of patients, study participants, or the public; violation of patient or study participant confidentiality; institutional review board (IRB) violations; forgery, alteration, or misuse of any university document, record, or instrument of identification; disorderly, lewd or indecent conduct; disrespectful communications in all forms including verbal, written, email, and text message; failure to be accountable or take responsibility for one's actions; and any other conduct unbefitting a professional public health practitioner, researcher, or educator.

3. Alcohol and Drug Use

Excessive alcohol and/or drug use compromises the student's ability to learn and to practice as a public health professional and thus is considered unprofessional conduct. Students who misuse alcohol and/or drugs should seek assistance from services available on campus or elsewhere. The sale of drugs or the possession of narcotics (unless prescribed by a medical doctor) is against the law. To minimize the potential for excessive alcohol use at campus functions, students must adhere to current University policy governing the consumption of alcohol on campus.

4. Respect for the Rights and Property of Others

Students should always conduct themselves in a manner that recognizes the rights and property of others. Examples of prohibited behavior include theft, damage to University or personal property of others, disruption of educational or other activities on campus, illegal use of University facilities, sexual harassment, physical assault, violation of academic honesty standards in a way that affects other students or faculty, such as in a group or collaborative project, and any conduct that threatens the health or safety of others.

5. Adhere to all state and local public health and safety orders and campus public health and safety policies.

Students are responsible for knowing and following all health and safety orders and policies. Examples include the wearing of face coverings, guidelines for social gatherings and events, quarantines, isolation, orders to shelter in place, and any other public health and safety orders and policies.

Any student found to have committed acts of misconduct (including, but not limited to cheating, plagiarism, misconduct of research, breach of confidentiality, or illegal or unlawful acts) will be subject to the procedures outlined in the Honor Code.

Additional information regarding the ColoradoSPH Honor Code can be found online at: <https://coloradosph.cuanschutz.edu/education/calendars-policies>

Academic Grievance Policy

The Colorado School of Public Health (ColoradoSPH) recognizes that a student may have grievances about different aspects of his or her academic program. ColoradoSPH is committed to addressing these grievances promptly and professionally and reaching a fair resolution through a formal and unbiased process. In the statements below, "Associate Dean" refers to the Associate Dean for Academic and Student Affairs.

Student Rights

1. All ColoradoSPH Students have the right to:
2. Competent instruction
3. Access to instructors outside of class during a specified set of office hours or by appointment
4. Clearly understand the grading system by which he or she will be judged, and expect that the grading system as determined by the instructor will be adhered to for the duration of the course
5. Be treated with respect and equality
6. Be treated fairly according to standards stated within the student handbook and each course syllabus

If a student feels as if they have been denied one of the above rights, that student may file a formal grievance with the school.

The full Academic Grievance policy can be found online at:
<https://coloradosph.cuanschutz.edu/education/calendars-policies>

Non-Discrimination Policy Statement

The University of Colorado, including ColoradoSPH, will not discriminate against any applicant, student or employee because of race, color, religion, sex, national origin, age, disability, creed, sexual orientation, or veteran status. The university and ColoradoSPH will take affirmative action to ensure that applicants, students, and employees are treated without regard to their race, color, religion, sex, national origin, age, disability, creed, sexual orientation, or veteran status. The University of Colorado Non-Discrimination Policy can be found at:
<https://www.cu.edu/ope/aps/5065>

Sexual Misconduct Policy Statement

It is the policy of ColoradoSPH to maintain the community as a place of work, study, and residence free of sexual harassment or exploitation of students, faculty, staff or administrators. All forms of sexual misconduct, including sexual harassment, are prohibited on campus and in any of the School's programs. ColoradoSPH is committed to taking appropriate action against any member of the University community who violates the policy. No retaliation will be taken against any individual for making a legitimate complaint. It is a violation of the ColoradoSPH policy to knowingly make a false accusation. For more information, please refer to the Title IX overview:

<https://www.ucdenver.edu/offices/equity/university-policies-procedures#ac-sexual-misconduct-intimate-partner-violence-and-stalking-policy-aps-5014-1>

Policy on Pregnancy and Parenting

The Colorado School of Public Health does not discriminate against any student on the basis of pregnancy, parenting status, or related conditions. Absences due to medical conditions relating to pregnancy will be excused for as long as deemed medically necessary by the student's doctor and the student will be given the opportunity, wherever possible, to make up missed work. Students needing assistance can seek accommodations from the Office of Disability, Access, and Inclusion (disabilityaccess@cuanschutz.edu) or the Title IX Liaison for ColoradoSPH (Madiha Abdel-Maksoud, madiha.abdel-maksoud@cuanschutz.edu).

Email Policy

Email is an official means of communication for ColoradoSPH students. All official email related to enrollment at ColoradoSPH (including, but not limited to, financial aid, billing, transcripts, school announcements) will be sent to each student's assigned CU email address (name@cuanschutz.edu), regardless of the student's home campus. Students are responsible for checking their CU email on a regular basis. The student Academic Honor and Conduct Code should be followed when using university email and other forms of university electronic communication and devices.

Students with a home campus of CSU or UNC should also frequently check their home campus email accounts, as any correspondence specifically from their home campus will be sent to that email address.

For questions regarding your CU email account, please contact the Anschutz Medical campus OIT Department at (303) 724-HELP or visit their website at:

<https://www.cuanschutz.edu/offices/office-of-information-technology/get-help>

Identification/Access Badges

Students are required to have an electronic security photo ID badge for the safety and protection of all faculty, staff, and students on campus. Additionally, this badge allows students access to buildings and computer labs after hours, as well as parking surfaces.

Badge applications for the CU Anschutz Medical Campus are issued to the ID Badge Office by the education staff prior to the start of a student's first semester in the program. Students should pick up

their badges at one of the badging pickup days or make alternate arrangements with the Office of Academic and Student Affairs.

Establishing Colorado Residency

There are three cases based on a student's residency at the time of matriculation:

- Residency in one of the Western Regional Graduate Program (WRGP) member states (Alaska, Arizona, California, Colorado, Guam, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Northern Mariana Islands, Oregon, South Dakota, Utah, Washington, and Wyoming): After being admitted a student will apply to the WRGP program and then qualify for in-state tuition. If the BIOS graduate program covers a student's tuition through a RA, the program will only pay the in-state tuition rate, and the student is responsible to pay the differential if they don't apply to the WRGP program. Details about the application process are available here: <https://coloradosph.cuanschutz.edu/admissions/tuition-aid/western-regional-graduate-program> Students in WRGP member states should not petition the University for residency.
- Residency in the US but not in one of the WRGP member states: If the BIOS graduate program covers a student's tuition through a RA, the program will cover the in-state and out-of-state portions of tuition for the first year. Upon arrival in Colorado the student should immediately begin the process of establishing Colorado residency. After one year in Colorado the student must petition the University for residency (this is not an automatic process). From year two on, the program will only cover the in-state tuition rate; the student is responsible to pay the differential if they don't establish residency in Colorado and petition the University for residency. The requirements for establishing residency for tuition purposes are defined by Colorado law. The statutes require that a qualified individual must be domiciled in Colorado for the twelve (12) consecutive months immediately preceding the term for which resident status is claimed.
- International students (not citizens or permanent residents): If the BIOS graduate program covers an international student's tuition through a RA, the program will pay the resident and non-resident tuition costs, if the student is not eligible to establish residency for tuition purposes.

A person's tuition classification status is initially determined from the Verification of Residency form submitted during the application process for admission. If a person is classified as a "nonresident," they must wait until eligible for a change in tuition classification and then file a petition for the change. Petitions that are denied may be appealed.

Rules and procedures for establishing Colorado residency are complex and rigid and the program does not have any influence over them. Therefore, students should carefully follow all instructions in the links below and consult those sources with questions.

WICHE (WRGP) website:
<https://www.wiche.edu>

CU Anschutz Medical Campus Registrar's website:

<https://www.cuanschutz.edu/registrar/residency>

Graduate School Resources and Policies: <https://graduateschool.cuanschutz.edu/forms-resources/resources>

Tuition and Fees

ColoradoSPH students receive a single bill for tuition and fees from the CU Anschutz Medical Campus Bursar's Office, regardless of their home campus affiliation. All students are charged the university matriculation fee, background check fee, and enrollment deposit (if applicable). Fees associated with the student's primary campus are also assessed. There are not additional general fees for taking courses outside of the primary campus, but course-specific fees may still apply. All students, regardless of their home campus, must follow university payment policies and deadlines. Additional information regarding fee and billing policies can be found on the bursar's website at:

<https://www.cuanschutz.edu/student-finances/billing-payments>

A breakdown of tuition and fees per campus can be found on the ColoradoSPH website:

<https://coloradosph.cuanschutz.edu/admissions/tuition-aid/cost-of-attendance>

Students must follow the published drop/add deadlines in order to receive a tuition refund for any dropped courses. For dropped courses processed before the semesters drop/add deadline, full tuition and fees will be refunded. ***Courses dropped after the semesters drop/add deadline will be considered withdrawals, and will not be refunded tuition and fees.*** For more information on dropping or withdrawing from a course, see "Registration Policies" section of this document.

The Academic Calendar, which specifies deadlines, including the drop/add deadline, can be found on the ColoradoSPH website:

<https://coloradosph.cuanschutz.edu/education/calendars-policies>

For students who have been approved to take a course(s) at the downtown UCD campus, the ColoradoSPH tuition rate will be charged for those courses, unless the student is enrolled in a dual degree program with the downtown campus. The ColoradoSPH tuition rate may be different than the downtown UCD campus rate.

Student funding

Students will typically be offered some form of funding during some or all of their time in the MS and/or PhD programs. Funding will be coordinated by the program director(s) and department chair. Three main types of positions are used to fund students:

Teaching Assistant (TA):

Teaching Assistants provide support to faculty members for teaching courses. Typical duties include holding scheduled review sessions and office hours, and assisting with grading. TAs with experience may help with course development and/or give some class sessions. TA positions pay \$25/hour with no tuition or benefits, and may be for up to 20 hours/week. A 'standard' TA position pays \$4,320 for a term, for a total of 144 hours of work (about 10 hours/week fall and spring, or 15 hours/week summer),

however positions of more or fewer hours/week may be available. TA pay rates and guidelines for allocating hours is set by the ColoradoSPH.

Research Assistant (RA) and Graduate Assistant (GA):

Students with appropriate experience in research and biostatistics may be offered a Research Assistant or Graduate Assistant position, based on qualifications and availability of funding. All Research Assistant (RA, stipend) positions are subject to the Graduate School Policies, including for Vacation and Leave at <https://graduateschool.cuanschutz.edu/forms-resources/resources>

These positions come with the expectation of on average 20 hours per week for 50 weeks per year of work on collaborative and/or statistical research projects specified by the RA/GA supervisor. It is recognized that different groups funding RA or GA positions may have different needs, therefore other expectations such as work schedules, project deadlines, etc., may be specified by RA/GA supervisors.

An RA/GA position constitutes a full-time position and any additional paid employment within or outside the university requires prior approval of the MS/PhD program director(s) and RA/GA supervisor. Rearrangement of working hours, e.g. for travel or additional preparation for exams, is allowed subject to agreement in advance with the RA/GA supervisor.

An RA/GA position is typically considered a one academic year commitment between the student, RA/GA supervisor, and biostatistics graduate program. Deviations from this will be considered on a case-by-case basis. RA/GA positions are “at will”, meaning either the student or RA/GA supervisor can terminate employment at any time, however funding is typically continued during the program based on satisfactory performance in the program and in the RA/GA position. MS students supported by RA funding are expected to complete their degree within two years of enrollment, and funding is continued beyond that only in cases of extenuating circumstances and with approval of the RA supervisor and Biostatistics program director(s). Graduate Assistant (GA, hourly) positions have similar expectations. RAs and GAs are subject to the rules and policies of the Regents of the University of Colorado, the Student Employment Office, the University of Colorado Denver Graduate School, and the Department of Biostatistics and Informatics.

RA and GA positions differ in their payment structure. RAs are paid an annual stipend based on rates set by the UCD Graduate School, and tuition, fees, student health insurance, and two weeks (at 20 hours/week) of vacation are also covered. GAs are paid an hourly rate, but no tuition, fees or student health insurance are covered. The rates are adjusted to provide on average similar compensation for 50 weeks/year (i.e., two weeks of vacation). The choice to use RA or GA funding mechanisms is based on the type of funding available and is determined by the program director(s) and RA/GA supervisor. RA stipend and GA hourly rates are based on achievement of program benchmarks (preliminary exam results) and previous academic degrees (MS degree in relevant field). For more details, current stipend and hourly rates, etc., see the program and human resources documents, or consult the program director(s).

Students supported by RA or GA funding who also do TA work are paid by one of two means: a) Substitution of equivalent percent of the RA/GA funding, tuition and insurance from TA funding sources, or b) Additional payment according to the CSPH TA payment policy into a professional development account. Joint RA/GA and TA arrangements are subject to approval by the Biostatistics program and RA/GA supervisor.

Employee Tuition Benefit

Employees of the University of Colorado and their dependents may be eligible for up to nine credit hours per year to be used towards University of Colorado courses. When employees are using the tuition benefit, registration can only occur 7 days prior to the first day of the semester or on or after the first day of classes. Students who intend to use employee tuition benefits (tuition waivers) should carefully review all policies and procedures associated with this benefit. For the entire policy, restrictions and forms, please visit the Payroll and Benefit Services website:

<https://www.cu.edu/pbs/tuition-benefit/>

By university policy, tuition waivers are accepted on a space-available basis. Some courses, particularly core courses, have been reaching their enrollment caps with tuition-paying students, therefore, there has not been space for students using tuition waivers. Students who wish to use a tuition waiver and who must take these courses in a particular semester should consider paying tuition for these core courses and using tuition waiver credits for other courses that have more space available.

The courses that are likely to fill before waiver-using students can register include, but are not limited to: EPID 6630, HSMP 6601, EHOH 6614, CBHS 6610, PUBH 6600, BIOS 6601, BIOS 6602, BIOS 6611, BIOS 6612, and BIOS 6623. If you are considering using a waiver for a BIOS course please contact the instructor prior to the course.

By university policy, tuition-paying students (including non-degree students) receive higher registration priority than students using tuition waivers.

By university policy, students using tuition waivers must not register for courses until the first day of classes. Violation of this policy can result in the student losing the ability to use a waiver for the class. This is monitored and students should be careful not to violate this policy. When using the tuition benefit, registration can only occur 7 days prior to the first day of the semester or on or after the first day of classes in order for tuition to be waived. Students who violate this policy are at risk of losing their tuition benefit. A new pilot program may allow dependents of employees to register with a tuition waiver as of fall 2017. Please visit the tuition benefit website for additional information.

Please note that CU Denver | Anschutz Medical Campus waivers may only be applied to courses at CU Denver/Anschutz Medical Campus. ColoradoSPH's CU Denver students cannot use waivers for CSU and UNC courses.

Employees on the CSU and UNC campuses using their employee tuition benefits may transfer in a maximum of 20 credits of approved public health coursework taken at a ColoradoSPH partner institution during the time of employment. Of these 20, a maximum of 10 non-degree credits are allowed prior to program matriculation.

Please visit the employee tuition benefit webpage for more information:

<http://www.cu.edu/employee-services/benefits/employee-tuition-benefit>

Financial Aid

All financial aid, regardless of a student's home campus, is processed through the CU Anschutz Medical Campus Financial Aid Office. All ColoradoSPH students interested in applying for financial aid should do so through the CU Anschutz Medical Campus. Detailed information can be found at:

<https://coloradosph.cuanschutz.edu/admissions/tuition-aid/financing-your-education>

For financial aid purposes, full-time status is considered five credits per term; part-time is considered 3 credits per term.

Advisors

The program director or another assigned faculty member will serve as an advisor to each student upon entry into the program. This is not a permanent assignment. Students may request to change advisors and often do so when putting together their examination committees. The faculty member selected to supervise the thesis, research paper or dissertation typically becomes the student's academic advisor/mentor as well. Students should meet with their advisor/mentor at least once per semester before starting work on a thesis/dissertation and should keep their advisor/mentor and the program director informed of study plans.

Grading Policy

The program adheres to the Graduate School grading policies as outlined in the Graduate School Handbook. In addition, the program has the following grading policies:

1. All course work must be completed on time. A student may be assigned an "I" (incomplete) grade, with advance agreement from the instructor, which will convert to an F grade after one year, if the coursework has not been completed.
2. MS Thesis, MS Research Paper, and Dissertation credits are assigned the grade IP until the final written paper is complete. At that time, a letter grade will be assigned retroactively.
3. In order to maintain satisfactory academic progress, advance to candidacy, and earn a graduate degree, students are required to maintain at least a "B" (3.00) average in all course work attempted while enrolled in the Graduate School. Courses in which grades below "B-" (2.7) are received are not accepted for any MS or PhD degree. Students that receive such grades may repeat that course once within 24 months with the approval of the graduate program. All grades received will appear on the student's transcript and will be included in the GPA calculation. If the course is a prerequisite for other courses, the student must obtain special permission from the instructor to enroll in an advanced course in the sequence before retaking the prerequisite.
4. MS and PhD students must obtain grades of B or above in the 'core' first year courses BIOS 6618/19 and 6631/32. Grades below B in these courses do not count toward the MS or PhD degree.

Leave of Absence Policy

Leaves of absence are arranged with and approved by the program director with the request, then forwarded to the Graduate School for final approval. A leave of absence may be approved for a maximum of one year. Students who fail to register or submit a Statement of Academic Intent after an absence of one academic year will be required to reapply for admission to the Graduate School through their program and be considered with all other applicants. A leave of absence does not automatically extend the time limit set forth for graduation.

Statement about COVID-19 at ColoradoSPH

The Colorado School of Public Health ended its vaccination requirement, effective July 1, 2023. ColoradoSPH is operating on a hybrid model, with some areas operating remotely and in-person activity permitted, as specified by the school or unit. Masks are not required of vaccinated and boosted individuals at this time. ColoradoSPH students and ColoradoSPH at CU Anschutz staff and faculty are no longer required to be vaccinated against COVID-19.

The CU Anschutz Medical Campus guidance policies remains in effect for everyone – regardless of vaccination status – who has COVID-19-like symptoms, tests positive or may have been exposed to a COVID-19 case. Anyone fitting these categories is asked to follow the protocol listed for each category under the Guidance section of the COVID-19 Protocols & Resources website: <https://www.cuanschutz.edu/coronavirus>.

Graduate School – Academic Policies

Academic Policies

The faculty of the Colorado School of Public Health believes strongly in an apprenticeship mode of learning. Much of the work is in the form of association with individual faculty members, leading to achievement of a set of skills and competencies enabling the student to function comfortably in the field.

Registration

Course offerings, academic year course book, academic calendar and registration dates are available on the ColoradoSPH website:

<https://coloradosph.cuanschutz.edu/education/courses-and-registration>

All students should register for courses through UCD Access. Students must have a CU email address to access the registration system. Students enrolling for the first time must meet with the program director prior to fall semester for annual academic advising before they can utilize web-based registration.

<https://portal.prod.cu.edu/UCDAccessFedAuthLogin.html>

Drop/Add Period

The drop/add period extends two weeks after the beginning of classes, except for summer semester when the drop/add date extends one week after the beginning of classes. To drop or add a class during

the drop/add period, please log onto UCD Access Registration Portal. Dropping courses after the drop/add deadlines will result in 0% tuition reimbursement and a corresponding grade of "W" (withdrawal) will be reflected on the transcript. Permission to register or drop a course after the add/drop period will be granted only in extenuating circumstances. Intercampus registration procedures should be followed when registering for a course at another CU campus. The procedures are:

1. Students may take no more than two courses or six semester hours (whichever is greater) off campus per semester.
2. Students download the concurrent registration form from the Registrar's Office website, complete the form, obtain the signature/permission from their Program Director, the instructor offering the course, the Assistant Dean of the Graduate School, then submit the form to the Registrar's Office.
3. Tuition and fees will be assessed at the UCD rate.

Transferring Credits

Graduate School rules allow students to transfer up to 12 semester credits towards a MS degree and 30 semester hours toward the PhD degree for courses taken either at other universities or as a non-degree student at UCD. Courses taken at any CU campus by students enrolled in a program are not considered transfer credits.

Transfer of credit from other universities must meet the following criteria:

1. The course must be graduate level, i.e., offered within the degree program at the 5000-level or above.
2. If offered outside the degree program, (including transfer credits), are 5000- equivalent level or higher and are approved for a specific degree plan by the program.
3. The grade must be at least a B- for MS students and at least a B for PhD students.
4. The student must have at least a 3.0 GPA in our program after at least one semester in the program.
5. The work must have been completed within the past five years or validated by the Program Director to ensure that the content has not significantly changed since the courses were taken.
6. The student must submit an outline and/or syllabus from the course to the program director for content review.
7. The request for transfer must be made on a form obtained from the Graduate School. The form must be completed by the student, endorsed by the advisor and the program director, and sent to the Graduate School along with an official transcript showing the course.

Foundational Public Health Knowledge Requirement

It is a requirement of the school's accreditation that all ColoradoSPH MS and PhD students are grounded in foundational public health knowledge. This is a curriculum requirement of both the Biostatistics MS and PhD programs. To satisfy this requirement, all MS and PhD students must complete the following courses:

- Foundations in Public Health (PUBH6600- 2 credits)
- Public Health Concepts for Non-MPH (EHOH 6601- 1 credit)
- Epidemiology (EPID 6630- 3 credits)

Students with a prior MPH degree or a graduate-level degree from a CEPH-accredited institution are eligible to waive this requirement.

Biostatistics MS and PhD students who are approved to waive this requirement are not required to replace these credits with additional elective coursework.

Degree Plans

Coursework Requirements

Students who have had some of the required (or equivalent) courses prior to admission into the program may be allowed to transfer in some of those courses to satisfy the program requirements. The following tables list the credit hours required to complete the MS and PhD in Biostatistics.

Biostatistics MS Requirements

Course Requirements	Credits
Required Biostatistics Courses	25 total
Advanced Biostatistical Methods I (BIOS 6618)	4
Advanced Biostatistical Methods II (Bios 6619)	4
Statistical Consulting (BIOS 6621)	2
Advanced Statistical Methods and Analysis (BIOS 6624)	4
Statistical Theory I (BIOS 6631)	4
Statistical Theory II (BIOS 6632)	4
Longitudinal Data Analysis (BIOS 6643)	3
Required Public Health Courses	6 total
Foundations in Public Health (PUBH 6600)	2
Public Health Concepts for Non-MPH (EHOH 6601)	1
Epidemiology (EPID 6630)	3
Elective Biostatistics Courses*	6 total
Causal Inference (BIOS 6641)	3
Introduction to Python Programming (BIOS 6642)	3
Survival Analysis (BIOS 6646)	3
Statistical Methods for Genetic Association Studies (BIOS 6655)	3
Thesis / Research Paper BIOS 6950 / 6651	4 total
Total Program Credits	41
* Electives not listed here must be approved by the program director to be used to satisfy this requirement. Some electives offered only in alternate years.	

MS minor areas (Statistical Genomics and Genetics; Data Science Analytics)

Students pursuing the MS Biostatistics program have the option to pursue one of two minors (Statistical Genomics and Genetics or Data Science Analytics). A "minor" is a small, optional grouping of courses designed to provide specialization for the MS degree in a certain topic area. MS students who choose a minor will have an official designation of specialization on their transcript, which may provide an advantage for students seeking careers or other opportunities within these minor areas. A separate document outlining each emphasis and the requirements and available courses will be provided by the Program Directors. Briefly, requirements for a minor include:

1. Three electives (8-9 credits). At least 5 credits must be from electives approved for the MS degree, and at least 5 credits must be from electives approved for the minor. Lists of such courses are given below. Courses not listed below may be acceptable, subject to program director approval.
2. A thesis or publishable paper with focus in the minor area.

Contact the Program Directors and the Academic Affairs Specialist if you intend to pursue a MS minor, and after completion so that it is included on your records.

Biostatistics MS Program Competency Statement

Biostatisticians are scientists with expertise in the theory and practice of the design, implementation, analysis and dissemination of translational, clinical, biomedical and public health research. Successful biostatisticians have a foundation in the fundamental aspects of statistics, including theoretical, applied, and computational elements to their training. In addition, there is an emphasis on written and verbal communication with those both inside and outside the field of biostatistics. This program strives to balance these elements in the design of the curriculum and the other educational opportunities created for students in the program.

No biostatistics or statistics professional organizations have developed a set of recommended competencies for MS programs in biostatistics. Thus, our MS competencies were developed to reflect the elements defined above in the various contexts in which biostatisticians work. Sources included the opinions of the faculty and students in the program, along with a review of other biostatistics MS programs' competencies. This review identified four overarching themes in which we center our degree specific competencies: biostatistical collaboration in study development; biostatistical modeling and analysis; biostatistics in biology and public health; and communication.

Biostatistics MS Program Competencies

At the culmination of the MS program, each student should be able to exhibit the following competencies:

Biostatistics MS Competencies
MS BIOS 1- Carry out and explain calculations, derivations and proofs central to basic statistical theory, and explain their use and implications in applied statistical work.
MS-BIOS 2- Apply statistical concepts of basic study designs including bias, confounding and efficiency, and identify strengths and weaknesses of experimental and observational designs.
MS-BIOS 3- Carry out exploratory and descriptive analyses of complex data using standard statistical software and methods of data summary and visualization.
MS-BIOS 4- Carry out valid and efficient modeling, estimation, model checking and inference using standard statistical methods and software.
MS-BIOS 5- Demonstrate statistical programming proficiency, good coding style and use of reproducible research principles using leading statistical software.
MS-BIOS 6- Demonstrate basic skills necessary for collaborating with non-biostatistical scientists, including mapping study aims to testable hypotheses, carrying out basic power and sample size estimation and evaluation, and identifying appropriate design, modeling and analysis methods to address study hypotheses.
MS-BIOS 7- Communicate, orally and in writing, simple and complex statistical ideas, methods and results in non-technical terms appropriate for collaborator needs (e.g. preparation of analysis section of grant proposals and methods and results sections of manuscripts).

Biostatistics PhD Requirements

Course Requirements	Credits
Required MS Biostatistics Courses	25
Elective MS Biostatistics Courses	6
Required Public Health Courses	6
Foundations in Public Health (PUBH 6600)	2
Public Health Concepts for Non-MPH (EHOH 6601)	1
Epidemiology (EPID 6630)	3
Required PhD Biostatistics Courses	6
Advanced Mathematical Statistics (BIOS 7731)	3
Theory and Algorithms in data Science (BIOS 7732)	3
Required PhD TA Instruction	1
Practical Pedagogy for Effective Instruction (BIOS 7710)	1
Elective PhD Biostatistics Courses*	9
Statistical Methods in Genomics (BIOS 7659)	3
Information Visualization (BIOS 7719)	3
Model Selection (BIOS 7722)	2
Machine Learning for Biomedical Applications (BIOS 7747)	3
Dissertation	30
Biostatistics Dissertation (BIOS 8990)	30
Total Program Credits	83

*Electives not listed here must be approved by the program director to be used to satisfy this requirement

Please note: The table above summarizes the requirements of the Biostatistics PhD program. Students in this program must also satisfy the requirements of the Graduate School, i.e. students must complete at least 30 credits of coursework, including transfer coursework or coursework taken in a MS program at UCDenver.

Health Science Electives

Health Science Electives can be replaced by other electives for students who have appropriate backgrounds or coursework (e.g. an M.D., D.V.M. or R.N. degree, or a graduate degree in a subject such as biochemistry, physiology, or immunology), with approval of the Program Director. Health Science electives consist of a total of 3 semester hours of graduate level course work and in some cases independent study. All doctoral students will be expected to acquire knowledge of at least one field of human biology or medicine. Such fields include, but are not limited to, human genetics, biophysics, medical physiology, clinical pathology, anatomy, human ecology, and health demography. The purpose of this work, along with required coursework in Public Health and Epidemiology, is both to provide a broader educational experience and to help prepare the student for the Graduate School comprehensive examination. The work is intended to help the student develop the ability to communicate and interpret quantitative and mathematical results to health professionals. BIOS courses and courses approved for one of the BIOS minors do not count as HS electives. The HS elective course should ideally be related to the topic of the dissertation. Course approval should be obtained by the Program Directors prior to taking the course.

Biostatistics PhD Program Competency Statement

Biostatisticians are scientists with expertise in the theory and practice of the design, implementation, analysis and dissemination of translational, clinical, biomedical and public health research. Successful biostatisticians have a good foundation in the fundamental aspects of statistics, including theoretical, applied, and computational elements to their training. In addition, there is an emphasis on written and verbal communication with those both inside and outside the field of biostatistics. This program strives to balance these elements in the design of the curriculum and the other educational opportunities created for students in the program.

No biostatistics or statistics professional organizations have developed a set of recommended competencies for PhD programs in biostatistics. Thus, our PhD competencies were developed to reflect the elements defined above in the various contexts in which biostatisticians work. Sources included the opinions of the faculty and students in the program, along with a review of other biostatistics PhD programs' competencies. This review identified four overarching themes in which we center our degree specific competencies: biostatistical collaboration, biostatistical research, biostatistics in biology and public health, and communication. At the culmination of the PhD program, each student should be able to exhibit the following competencies:

Biostatistics PhD Competencies
PhD BIOS 1- Carry out and explain calculations, derivations and proofs central to advanced statistical theory, and explain their use and implications in applied statistical work.
PhD BIOS 2- Carry out advanced statistical modeling using a range of statistical theory, methods and computation.
PhD BIOS 3- Demonstrate advanced collaborative biostatistical skills, including formulating testable study aims, identifying, designing and evaluating statistical analyses appropriate for study aims, reading and synthesizing biostatistical literature relevant to study analyses, and suggesting new methods when existing approaches are inadequate.
PhD BIOS 4- Carry out independent biostatistical research involving development and evaluation of novel statistical methods and their application to problems of importance in health science research, and report the methods and findings orally and in writing (e.g., a dissertation and publishable papers).

Biostatistics Preliminary and PhD Qualifying Examinations

MS and PhD students will take a written departmental examination at the end of their Year 1 coursework covering material from BIOS 6618-6619 and BIOS 6631-6632. This examination will be administered once a year, generally in June. Passing the exam is a requirement for completion of both the MS and PhD programs. The exam is separated into two parts, a four hour closed book exam covering theory (BIOS 6631-6632) and a one week take home exam covering methods (BIOS 6618-6619). Each part is graded separately. A pass for both parts of the preliminary exam is considered good for 3 years, or in special cases longer at the discretion of the program director(s). This is the Graduate School Preliminary Examination for PhD students. Please see Graduate School rules for more information:

<https://graduateschool.cuanschutz.edu/forms-resources/resources>

A student who fails the examination (or one part of the exam) is subject to immediate dismissal from the program on the recommendation of the graduate program and concurrence of the Assistant Dean of the Graduate School. At the program's discretion, a student who fails either or both parts of the examination may retake the failed parts once.

PhD students take a second qualifying exam covering BIOS 6624, 6643, and 7731. This is not an official Graduate School exam, but passing is a requirement for the BIOS PhD program. The same format (four hour theory and one week take home) and rules for re-taking the exams as for the first year preliminary exams apply.

MS students who would like to continue on to a PhD degree after the MS degree, or bypass the MS degree and proceed directly to the PhD, may apply for admission to the PhD program and will be evaluated by the admissions committee. The student's admission is based on examination results along with the student's entire record to date for admission into the PhD program. PhD students wishing to transfer to the MS program may generally do so, subject to approval of the Program Director.

MS Program Guidelines

MS Thesis or Research Paper

After successful completion of the preliminary examination, the student should assemble a thesis or research paper committee. The committee should have at least three members, and the majority of the members, including the chair, must be from the Biostatistics core-training faculty (included in this document). **Students must receive approval of their committee from the Program Director at least 3 months prior to scheduling the thesis defense.** The student should arrange committee meetings at least twice a year to discuss progress and a timeline for completing the thesis or research paper, and should meet with their mentor/chair often. First, a proposal is developed, 3-5 pages in length, outlining the background, significance and specific aims for the proposed research along with any preliminary findings. The proposal may be in the form of an early draft manuscript. The student then gives a short (~30-40 minute) presentation of the proposal to the committee (this is not a formal Graduate School exam so no paperwork is required). It is recommended that students and committee members set aside 2 hours for the proposal. When the proposal is approved by the committee, the members of the committee sign the proposal acceptance form found at:

<https://coloradosph.cuanschutz.edu/resources/for-current-students/academic-forms>

The acceptance form is forwarded to the Academic Affairs Specialist and placed in the student's file. Further details of the rules and deadlines are given in Appendix 1. Some guidelines on the process are given in Appendix 2. Both documents are located at the end of this document.

Note: At least 4 credits of MS Research Paper or MS Thesis is required. The option depends on which sort of project you plan – research paper or thesis. This decision is made by the student, supervisor and committee, once the project is well enough defined.

Application for Admission to Candidacy

Students must complete the application for admission to candidacy for the MS degree. The student initiates the DocuSign form found on the Graduate School website at least 2 weeks prior to the comprehensive exam date. The form is then forwarded to the Program Director, Advisor(s) and Program Administrator for verification of the courses listed that are to be applied towards the degree and signatures. The required DocuSign form can be found on the Graduate School website:

<https://graduateschool.cuanschutz.edu/forms-resources/resources>

MS Degree Final Examination

After all other requirements for the degree have been completed and approved for graduation; all candidates for the MS degree are required to take a final examination. The student must be registered for at least 1 credit the term they defend. The final examination is a presentation and defense of the thesis or research paper, as well as questions from the committee. The research paper or thesis must be submitted to and approved by the examining committee before scheduling the final examination. The Exam Request form is required to schedule the final exam/defense. Students must initiate the DocuSign form process at least two weeks prior to the final exam/defense date. The form will then be routed to the Program Director and Program Administrator to approve and sign. The Exam Request form can be found on the Graduate School website.

<https://graduateschool.cuanschutz.edu/forms-resources/resources>

Final Comprehensive Examination/Defense

The examination committee will conduct the final examination orally. The defense consists of a 40-50 minute seminar—generally open to the public unless otherwise specified—followed by an oral examination by the committee. All members of the committee must be present for the examination. One member, but not the chairperson or the student, may participate by interactive video. It is recommended that students and committee members set aside 2 hours for the defense. Below is a list of the possible outcomes:

Pass- You must receive the affirmative votes of the majority of the members of your committee in order to pass.

Pass with conditions- The committee may feel that although you have passed the examination you should complete additional work on the thesis. These conditions will be specified and must be satisfied within 60 days of the defense. Failure to satisfy these conditions will result in failure of the examination.

Fail- If you fail the examination, per Graduate School rules you may be subject to immediate dismissal from the program. At the program's discretion, you may be allowed to retake the examination once. The retake will be in a format designated by the committee and must be completed by the end of the next academic semester, excluding the summer term. It is important to note that students will be required to meet registration and enrollment requirements for the semester in which they re-take the examination.

A MS thesis is submitted to the Graduate School according to their format by deadlines set by the Graduate School. A MS research paper is submitted to a journal by the last day of the semester. If the research paper is otherwise complete and in submission format but there are delays for submitting, for example due to co-author holdup, or preparation of additional materials such as supplementary tables or code, the thesis advisor, committee and Program Directors may upon request and on a case-by-case basis approve the final product.

Graduation

Students must apply for a diploma for their intended semester of graduation by submitting an "Apply to Graduate" form through the UCD Access student portal by the specified deadline.

Ceremonies

A campus-wide commencement ceremony is held twice a year in May and December for the CU Anschutz Medical Campus. All graduates for that academic year are invited to attend. Students graduating in May or the previous August or December can attend the Graduate School graduation ceremony.. In addition, the ColoradoSPH offers a separate Convocation ceremony in May for the ColoradoSPH graduates.

Official regalia must be worn to participate in these ceremonies. Additional details will be posted on the website and emailed to students prior to the event.

Time Limit

MS students have **five (5)** years to complete all degree requirements, including the filing of the thesis or submitting the research paper, for the degree. Students who fail to complete the degree requirements within the five-year time period are subject to termination from the Graduate School upon recommendation from the Program Director and concurrence of the Assistant Dean of the Graduate School. Requests for extension will be considered under extenuating circumstances only.

Departmental Copy of Thesis or Research Paper

The program requests that an electronic copy of the thesis or research paper be provided for the department.

Transitioning to PhD program

Students interested in entering the PhD program following completion of their MS should consult with program director(s) and apply to the PhD program through SOPHAS.

PhD Program Guidelines

Teaching requirement

Biostatistics PhD students are required to be a Teaching Assistant (TA) for at least one semester. This will be arranged individually through mutual agreement of the instructor, program director(s) and student, and a variety of options may be considered, e.g. teaching in the CoSIBS program. The TA work must be done at an acceptable level as assessed by the instructor and program director(s). Students desiring more teaching experience may TA more than one semester with agreement of program director(s) and RA/dissertation supervisor. Payment will typically be made by substituting TA funds for RA funds. Students are allowed to TA one semester for payment into a professional development fund rather than substitution.

Seminar/Working group requirement

Biostatistics PhD students are required to attend and participate in some department seminars and/or working groups each year. Students must accumulate a total of 10 points each academic year (5 points each year for part-time students). One point is earned for each research seminar or working group attended, and 5 points are earned for each seminar or working group presented. This requirement is self-documenting - each student is responsible for submitting a summary of their attendance and participation in May at the end of each academic year. The summary consists of a brief (few sentences) summary of each session attended, or the materials used for any presentations. In special circumstances exceptions will be considered by program director(s).

PhD Comprehensive Examination and Dissertation Defense Committee

Students select at least five members to serve as an examination committee for the Comprehensive Examination and Dissertation Defense. The majority of the members, including the chair and the mentor, must be from the Biostatistics core-training faculty. Membership on these committees is not required to be the same, though they typically are. This committee is required to meet at least twice a year. Further details of the rules and deadlines are given in Appendix I. Some guidelines on the process are given in Appendix II.

Application for Admission to Candidacy

Students must complete the Application for Admission to Candidacy form for the PhD degree. The student initiates the DocuSign form found on the Graduate School website at least 2 weeks prior to the comprehensive exam date. The form is then forwarded to the Program Director, Advisor(s) and Program Administrator for verification of the courses listed that are to be applied towards the degree and signatures. The required DocuSign form can be found on the Graduate School website

<https://graduateschool.cuanschutz.edu/forms-resources/resources>

To apply for candidacy, students must have passed both parts of the first year preliminary and PhD qualifying exam.

Scheduling the Comprehensive Exam

The Exam Request form is required to schedule the comprehensive exam. Students must initiate the DocuSign form process at least two weeks prior to the comprehensive exam date. The form will

then be routed to the Program Director and Program Administrator to approve and sign. The Exam Request form can be found on the Graduate School website.

<https://graduateschool.cuanschutz.edu/forms-resources/resources>

Comprehensive Examination

The Comprehensive Examination Committee will administer oral and written comprehensive examinations when a student has chosen a mentor/advisor, a dissertation topic, and is ready to initiate the project. ***The comprehensive exams must be taken no later than the end of the third year in the PhD program, except under extenuating circumstances.*** The student prepares and circulates to their committee a dissertation proposal of 10-12 pages and gives a presentation of 30-40 minutes to the committee. Other biostatistics core-training faculty may attend the presentation, but students and outside faculty members are not allowed. All members of the committee must be present for the examination. It is recommended that students and committee members set aside 2 hours for the comprehensive exam. Requirements for in-person exam meetings have been altered for an unspecified amount of time due to COVID-19, so please check with your program director to determine the current guidelines for video conferencing policies. The oral examination consists, primarily, of a presentation and discussion of the student's dissertation proposal. In addition, the student should demonstrate in-depth knowledge of the biological and methodological issues pertinent to the student's project. When both the written and oral parts of the comprehensive examination have been passed, and the other Graduate School requirements are complete, students can proceed with their dissertation. The required forms can be obtained from the Graduate School website:

<https://graduateschool.cuanschutz.edu/forms-resources/resources>

Below is a list of the possible outcomes for your comprehensive exam:

Pass- You must receive the affirmative votes of the majority of the members of your committee in order to pass.

Pass with conditions- The committee may feel that although you have passed the examination you should complete additional work on the thesis. These conditions will be specified and must be satisfied within 4 months of the comprehensive exam.

Fail- If you fail the examination, per Graduate School rules you may be subject to immediate dismissal from the program. At the program's discretion, you may be allowed to retake the examination once. The retake will be in a format designated by the committee and must be completed within 12 months. It is important to note that students will be required to meet registration and enrollment requirements for the semester in which they re-take the examination.

Continuous Registration Requirement - Post Comps

Following successful completion of the Graduate School comprehensive exam, students must register for at least 5 dissertation credits, BIOS 8990, each semester (excluding the summer semester). If the comprehensive exam or dissertation defense is during the summer semester, the student must register for dissertation credits for that semester. A maximum of 10 dissertation credits can be taken in any

semester, unless approval is received from the Assistant Dean of the Graduate School. ***It is recommended that a maximum of 10 of the dissertation credits are taken prior to the comprehensive examination, and that at least 20 dissertation credits, out of the 30, are taken after the comprehensive exam.***

Note: Once a student has completed 30 dissertation credits, then the student is only required to register for one dissertation credit for each fall and spring semester until program completion. Summer registration is only required if the student plans to do their examination during summer semester.

Post-Comp Committee Meetings

Students are required to meet with their Dissertation Committee at least twice each year.

Dissertation

A dissertation based upon original investigation and showing mature scholarship must be written and approved by the student's examining committee. It must be submitted to the committee **at least 2 weeks** prior to the final examination.

The Exam Request and Biosketch forms are required to schedule the dissertation defense. Students must initiate the DocuSign form process at least two weeks prior to the defense date. The forms will then be routed to the Chair, Program Director and Program Administrator to approve and sign. The Exam Request form can be found on the Graduate School website:

<https://graduateschool.cuanschutz.edu/forms-resources/resources>

All Graduate School guidelines and specifications must be followed. Again, students must register for a total of 30 semester hours of doctoral dissertation credit, with no more than 10 credits taken in any one semester.

Defense

A final examination of the dissertation and related topics will be conducted orally by the examination committee. The defense consists of a seminar of 40-50 minutes, open to the public, followed by oral examination by the committee. All members of the committee must be present for the examination. It is recommended that students and committee members set aside 2 hours for the final defense. Below is a list of the possible outcomes for your defense:

Pass- You must receive the affirmative votes of the majority of the members of your committee in order to pass.

Pass with conditions- The committee may feel that although you have passed the examination you should complete additional work on the thesis. These conditions will be specified and must be satisfied within 60 days of the defense.

Fail- If a student fails the examination, s/he may not continue in the program.

Departmental Copy of Dissertation

The Program requests that an electronic version of the dissertation be provided for the department.

Receiving an MS while in the PhD program

Many students admitted to the PhD program without a previous MS in a related field choose to obtain an MS while doing their PhD. The only additional requirement is the MS thesis or research paper. In such cases the student should discuss their plans with the Program Director soon after passing the MS qualifying exams, as special procedures are needed.

Faculty and Courses

Biostatistics Faculty

All MS or PhD committee members must have, or be eligible for, a Graduate School faculty appointment. A Graduate School faculty appointment directory listing is posted on-line at:

<https://graduateschool.cuanschutz.edu/forms-resources/resources>

For any committee member who requires a Graduate School faculty appointment, the student must forward the committee member's current curriculum vitae to the Academic Affairs Specialist who will process the appointment. For MS students, the chair and mentor may be the same person on the student's examining committee. For PhD students, the student's main technical advisor **may not be** the Chair of the examining committee.

A MS or PhD committee must have an odd number of members, with a majority from the Biostatistics Department. A PhD committee must have at least one member from another discipline (not from the Biostatistics Department). If in doubt about committee composition or members, consult the program (MS or PhD) director.

Organization & Content of Courses

Below is a list of courses offered by the Department of Biostatistics and Informatics. The most up to date information is always found on the ColoradoSPH website, including brief course information in the Coursebook and offerings for each semester/term in the Schedules:

<https://coloradosph.cuanschutz.edu/education/courses-and-registration>

- N No credit for BIOS MS and PhD
- M Required for BIOS MS
- P Required for BIOS PhD (beyond MS)
- EM Elective for BIOS MS
- EP Elective for BIOS PhD
- G Elective for BIOS MS minor in Statistical Genomics and Genetics (some courses from other departments are also acceptable minor electives, subject to program director approval)
- D Elective for BIOS MS minor in Data Science Analytics (some courses from other departments are also acceptable minor electives, subject to program director approval)

These designations do not include the thesis, research paper, dissertation, special topics, independent study, etc.

Designation	Course #	Name	Credits
D	BIOS 6310	Practical Clinical Research Informatics	3
D	BIOS 6420	Data Science and Analytics of Continuous Clinical Data	3
N	BIOS 6601	Applied Biostatistics I	3
N	BIOS 6602	Applied Biostatistics II	3
N	BIOS 6603	Statistical Computing – SAS	1
N	BIOS 6606	Statistics for the Basic Sciences	1
N	BIOS 6611	Biostatistical Methods I	3

N	BIOS 6612	Biostatistical Methods II	3
M	BIOS 6618	Advanced Biostatistical Methods I	4
M	BIOS 6619	Advanced Biostatistical Methods II	4
M	BIOS 6621	Statistical Consulting	2
N	BIOS 6623	Advanced Data Analysis	4
M	BIOS 6624	Advanced Statistical Methods and Analysis	4
N	BIOS 6628	Latent Variable Analysis	3
N	BIOS 6629	Applied Survival & Longitudinal Data Analysis	3
M	BIOS 6631	Statistical Theory I	4
M	BIOS 6632	Statistical Theory II	4
N	BIOS 6640	R for Data Science	3
EM	BIOS 6641	Causal Inference	3
EM/D/G	BIOS 6642	Introduction to Python Programming	3
M	BIOS 6643	Analysis of Longitudinal Data	3
D	BIOS 6644	Practical Data Wrangling	2
D/G	BIOS 6645	Predictive Analytics	3
EM	BIOS 6646	Survival Analysis	3
N	BIOS 6648	Design & Conduct of Clinical Research	3
	BIOS 6649	Clinical Trials: Statistical Design and Monitoring	3
	BIOS 6650	MPH Research Paper	1 – 2
	BIOS 6651	Masters Research Paper	1 – 6
EM/G	BIOS 6655	Statistical Methods for Genetic Association Studies	3
D/G	BIOS 6660	Analysis of Genomic Data Using R and Bioconductor	2
	BIOS 6670	Special Topics: Biostatistics	1 – 3
N	BIOS 6680	Data Management Using SAS	3
D	BIOS 6681	Structured Query Language using SAS PROC SQL	1
N	BIOS 6685	Introduction to Public Health Informatics	3
	BIOS 6840	Independent Study for MPH in Biostatistics	1 – 3
	BIOS 6841	Independent Study for MS in Biostatistics	1 – 3
	BIOS 6950	Master Thesis: Biostatistics	1 – 6
EP/D/G	BIOS 7659	Statistical Methods in Genomics	3
	BIOS 7670	Advanced Special Topics – Biostatistics	1 – 3
	BIOS 7712	Statistical Methods for Correlated Data	1
	BIOS 7713	Missing Data in Longitudinal Studies	2
	BIOS 7714	Advanced Statistical Computing	3
	BIOS 7715	Stochastic Modeling	2
	BIOS 7717	Bayesian Biostatistical Methods	3
D	BIOS 7718	Introduction to Biomedical Image Analysis	3
EP/D	BIOS 7719	Information Visualization	3
EP/D	BIOS 7722	Model Selection	2
P	BIOS 7731	Advanced Mathematical Statistics	3
P	BIOS 7732	Theory and Algorithms in Data Science	3
EP/D	BIOS 7747	Machine Learning for Biomedical Applications	2
	BIOS 7899	Independent Study for PhD in Biostatistics	1 – 4
	BIOS 8990	Doctoral Thesis	1 – 10
M	EPID 6630	Epidemiology	3
M	PUBH 6600	Foundations in Public Health	2
M	EHOH 6601	Public Health Concepts for Non-MPH	1

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Appendix I

Biostatistics MS and PhD Comprehensive and Final Exam Procedures and Checklists*

* (Graduate School rules supersede these)

All Exams

The student should talk with the program Co-Directors Carsten Görg or Brandie Wagner prior to the start of the semester they plan to take any of these exams, and for any assistance with the steps below. Most of these deadlines are Graduate School rules and are not flexible. If you miss the deadline, then you may not be able to take exams or graduate when expected.

MS Thesis Committee Final Exam Checklist

- At least 3 members and an odd number of members.
- At least a majority, including the chair, from Biostatistics core faculty.
- All must have graduate faculty appointments. People from other departments, schools, or universities may need to have this arranged. Check with the Academic Affairs Specialist at least 3 months before the exam to make sure all of your committee members have appointments, and to arrange for any who do not.
- The chair is responsible for running the exam, paperwork, reporting results, etc.
- Changes can be made to the committee, with approval of the program director. If a committee change occurs after the paperwork has been submitted to the Graduate School, the Graduate School must also be notified of the committee change.

PhD Dissertation Committee Checklist

- At least 5 members, and an odd number of members.
- At least a majority, including the chair, from Biostatistics core faculty.
- At least 1 member not from Biostatistics core faculty.
- All must have graduate faculty appointments. People from other departments, schools, or universities may need to have this arranged. Check with the Academic Affairs Specialist at least 3 months before the exam to make sure all of your committee members have appointments, and to arrange for any who do not.
- The chair and mentor cannot be the same person.
- The chair is responsible for running the exam, paperwork, reporting results, etc.
- Changes can be made to the committee, with approval of the program director. If a committee change occurs after the paperwork has been submitted to the Graduate School, the Graduate School must also be notified of the committee change.

MS Final Exam/Thesis Defense

Student

- The MS final exam/thesis defense must be done within 5 years of officially beginning the program.
- Be registered during the term the exam is taken. Students who schedule their exams after the last day of a term must register in the subsequent term. Contact the Academic Affairs Specialist for deadlines.
- Early in term of graduation, complete an "Apply to Graduate" form through the UCD Access student portal.
- At least 3 months before exam: Request any graduate faculty appointments.
- At least 2 weeks before scheduling the exam file the *Application for Admission to Candidacy Form*.
- At least 2 weeks before exam: File Exam Request form.
- At least 3 weeks before exam: Get paper or thesis draft to committee.
- After the exam and before the end of the term of the defense: Submit the thesis or paper (see Graduate School graduation deadlines calendar for deadlines, they differ for theses and papers).

Chair

- Before exam: Get exam paperwork from the Graduate School through DocuSign.
- After exam: Return exam paperwork to the Graduate School through DocuSign.

PhD Comprehensive (Oral) Exam

Student

- This exam should be done no later than one year after completing the PhD written qualifying exam and completing all required coursework, and it must be done within three years of officially entering the program. In exceptional cases these deadlines may be extended.
- Be registered during the term the exam is taken. Students who schedule their exams after the last day of a term must register in the subsequent term.
- At least 3 months before exam: Request any graduate faculty appointments.
- At least 2 weeks before exam: File "Application for Admission to Candidacy" form.
- At least 2 weeks before exam: File "Exam Request" form."
- At least 3 weeks before exam: Get proposal to committee.

Chair

- Before exam: Get exam paperwork from the Graduate School through DocuSign.
- After exam: Return exam paperwork to the Graduate School through DocuSign.

PhD Final Exam/Dissertation Defense

Student

- The final PhD defense must be done within seven years of officially entering the program.
- Be registered for at least 1 dissertation credit during the term of the defense. Students who schedule their examinations after the last day of a term must register in the subsequent term.
- Early in term of graduation, complete an "Intent to Graduate" form through the UCD Access student portal.
- At least 3 months before exam: Request any new graduate faculty appointments.
- At least 2 weeks before exam: File Exam Request and Biosketch forms.
- At least 3 weeks before exam: Get Dissertation to committee.
- After the exam and before the end of the term of the defense: Submit the dissertation (see Graduate School graduation deadlines calendar for deadlines). This requires the Thesis Approval form signed by all committee members, which the student should print from the Graduate School website and bring to the defense.

Chair

- Before exam: Get exam paperwork from the Graduate School through DocuSign. There are two forms to be signed by the committee, one giving results from the exam and one approving the dissertation. They should be sent to you by the Graduate School through DocuSign.
- After exam: Return exam paperwork to the Graduate School through DocuSign.

Appendix II

UCD Biostatistics Graduate Program Guidelines for Thesis, Research Paper or Dissertation

The purpose of this document is to describe the general steps toward successful completion of the research component (thesis, research paper, or dissertation) of an MS or PhD degree in Biostatistics. It is important to approach these components systematically because they are of a different nature from coursework and require a more active role of the student. In fact, the research component is as much about learning the processes of research, writing, and managing large projects as it is about the biostatistical content. Since this is a new (for most students) and less structured part of your education, it is easy to get stuck at this point in the process. This document is intended to make that less likely.

General sequence

The general steps in completing the research components of the degrees are listed below. Roughly, the steps for both MS and PhD degrees include completing coursework, passing written preliminary and PhD qualifying examinations, selecting a research topic and supervisor, preparing a proposal, getting the proposal approved, doing the work, writing the paper or thesis, and defending it. In some cases it is possible to deviate from the order listed below – contact the Biostatistics Program Director(s) if you are considering doing so.

General Timing Rules

If you have taken graduate-level coursework at another accredited university you may be able to transfer those credits to UCD with approval from the Biostatistics Program Director(s). Credits can be transferred after you have completed at least one semester of coursework, and prior to (not during) the semester of your graduation. There are rules about what credits can and cannot be transferred. Some of these rules are a bit flexible; some are not, so consult the director(s) for advice.

MS students have five years and PhD students have seven years from entry into the program to complete all degree requirements. You must remain registered each semester (excluding summers). If you do not register you may be dropped from the Graduate School and required to re-apply for admission. If you need to take a break from your degree program for personal reasons, you may request a leave of absence for up to one year. 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.

MS students must enroll full-time at UCD for a minimum of two semesters however; at least four semesters of credit must be earned for work performed while enrolled at UCD. For PhD students, the requirement is six semesters beyond a BS degree. For PhD students, two semesters may be allowed for a MS from another accredited institution. Full-time enrollment means a minimum of five credits of coursework or at least 1 credit of MS Thesis, Research Paper, or Candidate, or for PhD students at least 1 credit of Dissertation (prior to the oral Comprehensive exam) or 5 credits of Dissertation (after passing the oral Comprehensive exam) up to at least 30. After 30 dissertation credits, then ColoradoSPH PhD students only have to register for 1 dissertation credit for fall and spring semester. Summer enrollment is only required if you plan to take your comprehensive or final exam during summer semester.

Written preliminary exams (May/June each year)

MS

For an MS degree, both parts (theory and methods) of the first-year preliminary exam must be passed. Students should plan to take these exams as soon as they have completed the required courses (BIOS 6618/19 and BIOS 6631/32). The exams may be taken separately, in different years, which is often the case for part time students.

PhD

For a PhD degree, both parts (theory and methods) of the first preliminary exam must be passed. A pass on the first-year preliminary exam is considered good for 5 years, or in special cases longer at the discretion of the program director(s). This is the official Graduate School Preliminary exam. The second set of qualifying exams must also be passed. Students should plan to take the second exam as soon as they have completed the required biostatistics courses (BIOS 6624, 6643 and 7731). Students entering the program with an MS degree from another university are required to take the first preliminary exam at the end of their first year. Students with a previous relevant masters and coursework corresponding to BIOS 6618/19 and/or 6631/32 may choose to take the preliminary exams the summer prior to entering the PhD program. For this particular case, passing counts as an official pass, but a no pass does not count as the first official attempt.

Students who do not pass either or both parts of the preliminary exams may, depending on the quality of their other work in the program, be allowed to re-take the failed parts.

Research: Thesis and dissertation process

Students are encouraged to begin talking with potential research supervisors as soon as possible after entry into the program, and do not have to wait until taking or passing these preliminary exams to begin the other steps below.

1. **Select a topic and/or a supervisor.** We encourage students to talk with a number of faculty members about possible topics. If you have not already done so, begin soon after the preliminary exams. Contact faculty you think you may want to work with, or faculty in an area that interests you. You are not making any commitment to work with that person, nor they with you. Do not assume that you need to find a topic on your own, but also do not assume that you will just be handed a topic to work on, you may be involved in developing the topic. It will help very much if you have some interests or specific things to suggest. Topics, particularly for MS theses and research papers, very often arise from student work or consulting, so watch for projects that have interesting twists or issues, or things at work that you or your colleagues have wanted to work on but never seem to find the time. You may want to talk with several faculty members before deciding. It is fine and sometimes natural to work closely with two faculty members in a joint supervision arrangement.

Technical issues: During this time students may register for MS Thesis or Research Paper credits or PhD dissertation credits. A grade of "In Progress" (IP) will be assigned in all semesters until the final examination or thesis is submitted to the Graduate School Office. The Graduate School will then obtain the thesis grade, and all IPs then will be changed to this final grade.

MS: Master's students must register for a total minimum of four semester hours of thesis (BIOS 6950) or research paper (BIOS 6651).

PhD: PhD students must register for a total of at least 30 semester hours of dissertation to complete the requirements for the PhD degree. A student may not register for more than 10 dissertation credit hours in any one term without permission.

2. **Form a committee.** When you and your likely supervisor(s) are fairly confident you have a good topic or specific area, begin forming a committee. You and your likely supervisor should determine other faculty you would like to work with and who would add expertise in your area. When you have agreed, ask and probably meet with each of those people to describe your proposed work. You and your committee should meet as a group at least once every six months and the committee chair should place a note in your student file describing the meeting.

Technical issues: An MS committee must have at least 3 members with the majority, including the chair, from the core Biostatistics training faculty. A PhD committee must have at least 5 members, a majority (including the chair and mentor) from the core Biostatistics training faculty and at least one who is not. A committee must have an odd number of members (to avoid ties). For PhD committees the mentor and chair must be different. The committee chair is responsible for monitoring the conditions and reporting their outcome to the Graduate School. The mentor(s) (sometimes referred to as supervisor(s)) typically guides the research. All members of the committee must be present for the comprehensive and final examinations. All members of MS and PhD committees must have appointments in the UCD graduate school. Faculty from other schools or universities are often fine, but will need to receive a special appointment to the Graduate School faculty. Members outside of Biostatistics (e.g. clinicians or investigators in other fields) may need such an appointment too. This can be done (subject to approval of the Program Director(s)) by contacting the Academic Affairs Specialist. This must be done early and cannot be done retroactively. Changes can be made to committees, subject to approval of the program director(s).

3. **Draft a proposal.** A proposal should describe your proposed topic, background and relevant literature, basic theory and methods, and mainly your intended approaches. It is meant to be an agreement between you and your committee, describing expectations on both sides. An MS proposal should be about 3-5 pages, a PhD proposal about 10-12 pages. You and your supervisor (and perhaps other committee members you are working closely with) should work together to get this in good shape, and then circulate it to your committee for comments. The PhD work and thesis should show originality on the part of the student and be of publishable quality for a *statistical* journal. An MS thesis should involve an original application of statistical methods at a level somewhat beyond what is typically covered in coursework and be of publishable quality for a journal. In particular, an MS thesis or research paper need not contain new statistical methods or be publishable in a *statistical* journal, though many MS theses do and are published in statistical journals.
4. **Oral comprehensive exam (PhD) or proposal approval (MS).** The proposal must be approved by your committee. The proposal is presented to the committee at an in-person meeting. The written proposal should be provided to the committee 1-2 weeks prior to the in-person meeting as indicated by the committee members.

Technical issues: PhD students must apply for candidacy and the student's advisor and program director must approve the completed application form for admission to candidacy for the doctoral degree at least two weeks before taking the PhD oral comprehensive examination. Students must be registered at the time they take the comprehensive examination for the PhD degree. Students who schedule their examinations after the last day of a given term must register in the subsequent term. Before being admitted to candidacy, doctoral students must complete at least three semesters of residence, complete or register for all program-required, non-thesis coursework, and pass the oral comprehensive examination. The oral comprehensive examination must be completed no later than the end of the student's third year. With the recommendation of the program directors and concurrence of the Assistant Dean, the examination may be taken during the fourth year. If a student passes the examination with conditions, those conditions must be stated on the examination form and satisfied within four months. At the program's discretion, a student who fails the examination may retake it once. The retake will be in the form designated by the committee and must be completed within 12 months.

MS: For MS students this is a committee meeting but not a formal examination or presentation for the Graduate School. It is recommended that the student give a short (~30) minute presentation of the proposal to the committee. The supervisor should place in the student's file a copy of the accepted proposal along with a note saying it was accepted.

PhD: For PhD students, this is the official Graduate School Comprehensive Exam. PhD students present a 30-40 minute talk on the proposal to their committee and can be asked questions about it or any other aspects of their course work or research area. It is recommended that students and committee members set aside 2 hours for the comprehensive exam. The oral part of the comprehensive examination is open to members of the Graduate Faculty. Upon successful completion of the exam and acceptance of the proposal, the chair files a form with the Graduate school and places a copy of the form and the proposal in the student's file.

5. **Do the work.** Work with your supervisor and committee members to carry out what you outlined in the proposal. As things develop there will likely be some variation from the proposal, which is OK. Major changes in direction would best be considered as a new proposal. For students, faculty, and investigators, research typically involves collaboration. Some people prefer to meet regularly (e.g. weekly), others meet upon request. You should not spend long periods of time working alone without talking with your supervisor -- this is a recipe for delay and/or failure. Committees should meet at least once every six months, and a note of progress put in the student's file by the committee chair. The thesis must meet the formatting criteria outlined in the UCD Thesis Specifications available on the Graduate School website. The MS Research Paper must be in a form to be submitted to a journal.
6. **Defend the thesis, research paper or dissertation.** The defense is the official Graduate School Final Exam for the MS or PhD degree. A final exam for MS or PhD in Biostatistics consists of a 40-50 minute presentation by the student that is open to the public, followed by questions and then an examination by the committee only. It is recommended that students and committee members set aside 2 hours for the final exam. The thesis, research paper or dissertation should be essentially complete when the Final Exam is taken, and the student must submit finalized draft copies to the committee at least two weeks before the examination date. You should

consult the graduate school at least several months before you plan to graduate to make sure you have filed the necessary paperwork.

Technical issues: Students must be registered at the time they take the final examination for MS or PhD degrees. Students who schedule their examinations after the last day of a given term must register in the subsequent term. The Graduate School must be notified on the appropriate forms at least two weeks before the exam. Students must file an "Intent to Graduate" through the UCD Access student portal no later than the posted deadline for the term in which they plan to have their degrees conferred. All members of the committee must be present for the examination. If a student passes the examination with conditions, those conditions must be satisfied within 60 days for the MS degree and the PhD degree.