

colorado school of
public health

UNIVERSITY OF COLORADO
COLORADO STATE UNIVERSITY
UNIVERSITY OF NORTHERN COLORADO

Graduate Programs in Biostatistics

2016-2017

Student and Advisor Handbook

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Policy Regarding Changes to the Graduate School Handbook

This handbook complements the "Graduate Student Handbook" distributed by the Graduate School on admission to the University of Colorado Anschutz Medical Campus. It includes information specific to the Colorado School of Public Health and the Biostatistics Graduate Programs. Please retain it for reference on academic policies, thesis, graduation, and other topics. This handbook was accurate and up to date when printed in June 2016. 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. Given recent changes to the administrative structure at the Colorado School of Public Health, the "program coordinator" temporarily refers to the Office of Student Affairs.

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/GSOCTFORMS/Graduate%20Student%20Handbook.pdf>

Websites

School Site:

<http://publichealth.ucdenver.edu>

Program Site:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/departments/Biostatistics/Pages/welcome.aspx>

Academic and Student Affairs Resources:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/index.aspx>

Message from the Associate Dean for Academic Affairs



Welcome to the Colorado School of Public Health!

This is an extraordinary time to be working on community and population health. There is a rejuvenated realization that many of the determinants of health lie not in medical care, but in our social and physical communities, the exposures we receive from the environment, the health care systems that we have access to, and the choices we make in our daily behaviors.

We are a collaborative school of public health, with a strong partnership between three major public universities, and also with our ties to and belief in the importance of communities using scientific evidence to develop their own priorities and strategies for achieving health.

As you embark on your studies, I encourage you to reach out to faculty for mentorship. There are vast opportunities for you to be involved in education, research and practice. I encourage you to get involved beyond the classroom. It is our vision that together we will learn and work to allow all members of our communities reach their highest potential for healthy, productive lives.

As the Associate Dean for Academic Affairs, I encourage you to explore all of the opportunities that the Colorado School of Public Health has to offer.

Sincerely,

A handwritten signature in cursive script that reads "Lori A. Crane".

Lori A. Crane, PhD, MPH
Associate Dean for Academic Affairs

Colorado School of Public Health

Overview

The Colorado School of Public Health is a collaborative school of public health with the University of Colorado, Colorado State University, and the University of Northern Colorado. It is the first school of public health in a nine-state region of the Rocky Mountain West.

Emerging infectious diseases, chronic diseases, emergencies, lifestyles, the environment, disparities and various other factors impact the health of our communities. The Colorado School of Public Health aims to meet the challenges that our communities face by preparing a public health work force with the skills, research, knowledge, and values necessary to advance the health of our communities. The combined faculty, located at the three partner institutions, is at the forefront of various health issues and research, proactively addressing and improving the lives of our children, adults and aging populations.

As part of the commitment to meeting the training and research needs of the public health workforce, the Colorado School of Public Health offers educational programs that include masters, doctoral, residency, and certificate programs. Descriptions and materials are available through the Colorado School of Public Health website.

Mission Statement

The mission of the Colorado School of Public Health is to promote the physical, mental, social and environmental health of people and communities in the Rocky Mountain Region and globally. The mission will be accomplished through collaborations in education, population-based research, and community service that bring together institutions, agencies and diverse populations.

Vision Statement

The Colorado School of Public Health, a collaborative, multi-disciplinary, multi-institutional, learning, research and service environment, will inspire academicians, practitioners and students of public health to work collaboratively to assure that all people and communities are healthy and their environment sustainable.

Diversity Statement

The Inclusion, Diversity and Health Equity mission of the Colorado School of Public Health is to build a diverse and representative academic community, which recognizes the importance of social and economic justice in relation to health. The CSPH will work to build an inclusive, culturally competent institution, which includes the environment, policies and procedures, faculty, staff, leadership and student body.

Accreditation

The Colorado School of Public Health received school-wide re-accreditation in June 2016 from the Council on Education for Public Health (CEPH). CEPH is an independent agency recognized by the U.S. Department of Education to accredit schools of public health and public health programs outside of schools of public health. As an accredited school of public health, graduates at the masters and doctoral levels are eligible to sit for the Public Health Certification examination.

Administration

University Leadership & Academic Partners

Donald M. Elliman, Jr.
Chancellor, University of Colorado Denver &
Anschutz Medical Campuses

Anthony Frank, PhD
President, Colorado State University

P. Kay Norton, JD
President, University of Northern Colorado

Colorado School of Public Health Leadership

David C. Goff, Jr., MD, PhD
Dean

Elaine Morrato, DrPH, MPH, CPH
Associate Dean, Public Health Practice

Lori A. Crane, PhD, MPH
Associate Dean for Academic Affairs

Carolyn DiGuseppi, MD, PhD, MPH
Associate Dean for Faculty Affairs

Christine Gillen, MS
Associate Dean for Finance and Administration

Jan L. Gascoigne, PhD, MCHES
Associate Dean for Student Affairs

Spero Manson, PhD
Associate Dean of Research

Lorann Stallones, PhD, MPH
Director
Colorado State University

Tracy Nelson-Ceschin, PhD, MPH
Associate Director
Colorado State University

Mary Dinger, PhD
Director
University of Northern Colorado

Department Chairs

Debashis Ghosh, PhD
Chair, Biostatistics & Informatics

Jim Finster
Director, Academic and IT Operations

Sheana Bull, PhD, MPH
Chair, Community & Behavioral Health

Jill Norris, PhD, MPH
Chair, Epidemiology

John Adgate, PhD, MSPH
Chair, Environmental & Occupational Health

Adam Atherly, PhD
Chair, Health Systems, Management & Policy

Anschutz Medical Campus

Tonya Ewers
Director of Communications & Alumni Relations

Amy Hebbert
Student Affairs Specialist

Christopher Harris
Enrollment Marketing & Communications Specialist

Olivia Jolly, MPH
Coordinator of Practice-Based Learning, Instructor

Maggie Kucharski, MA
Student Affairs Specialist

Ben Weihrauch, MA, GCDF
Manager of Career and Employer Relations

Chloe Bennion, MPH
Program Evaluation Coordinator

Brenda Witt
Academic Affairs Specialist

Graduate School

David Engelke, PhD
Dean

Inge Wefes, PhD
Associate Dean

Shawna McMahon, PhD
Assistant Dean

Teresa Bauer-Sogi
Admissions & Student Progress Coordinator

Patricia Goggans
Events Coordinator

Contact Information

Name:	Phone Number	Room
ColoradoSPH Office of Student Affairs	303-724-4613	Bldg 500, Rm E3360
Gary Grunwald	303-724-4360	Bldg 500, Rm W3106
Katerina Kechris	303-724-4363	Bldg 500, Rm W3133
Campus Office:	Phone Number	Room
Bookstore	303-724-2665	Ed 2 South
Bursar's Office	303-556-2710	Ed2 N, 3rd Fl
Campus Information	303-724-6245	
CU Online Help Desk (Canvas)	303-315-3700	
Disability Resources and Services	303-724-5640	Bldg 500, Rm W110
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	AO1, Rm 2609A
Ombuds (Counseling Services/Conflict Resolution)	303-724-2950	Bldg 500, Rm C7005
Parking	303-724-2555	Bldg 500, 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.

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 Bldg. 500 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 Floor of Building 500 or another room at the Anschutz Medical Campus for a committee meeting or defense, please contact Crystal Alvarado at (303) 724-8618, Crystal.Alvarado@ucdenver.edu.

Program Library

Statistics books, theses/research papers, and dissertations are available to check out. Please contact Dr. Grunwald or Dr. Kechris for locations of the resources.

Grand Rounds

The monthly Preventive Medicine Grand Rounds are presentations given by school faculty, faculty from other departments/schools, or professionals from other institutions. These events occur on the first Monday of every month, with the exception of September and January. In September, Grand Rounds is the 2nd Monday of the month. Grand Rounds are not held in January or June. Announcements are sent with the date, topic, and location of the seminar. The link for the schedule is:

<http://www.ucdenver.edu/Calendar/PublicHealth/Pages/AllEvents.aspx>

Biostatistics Seminars, Journal Clubs, and Working Groups

Biostatistics department seminars and journal clubs feature students, faculty, or outside speakers. The days and times will be announced early in the semester, but have been Wednesdays at 11:30. There are also special topic working groups (Genetics/Genomics, Causal Analysis, etc.) that meet monthly, watch email for announcements of all of these.

All students are encouraged to attend these activities.

Student Disability Resources & Services Office

The university welcomes and supports a diverse student body. The Disability Resources and Services Office is the designated office that maintains disability-related records, determines eligibility for academic accommodations, determines reasonable accommodations and develops plans for the provision of such accommodations for students attending the university.

Students requesting accommodations for a disability must contact one of the following:

Sherry Holden | Coordinator

University of Colorado Anschutz Medical Campus Disability Resources & Services

| Bldg. 500, Room Q20-EG 305A

Phone: (303) 724-5640, Fax (303) 724-5641

Part-time: Monday, Tuesday and Thursday

sherry.holden@ucdenver.edu

Selim Özi | Assistive Technology Specialist, Accommodation Coordinator

University of Colorado Anschutz Medical Campus Disability Resources & Services

| Mail Stop A010, Building 500, Room Q20-EG 306

Phone: (303) 724 8428, Fax: (303) 724 5641

selim.oz@ucdenver.edu

Be aware that the determination of accommodations can take a long period of time. No accommodations will be made for the course until written documentation is provided by the Disability resources and services office to the course directors. It is the student's responsibility to coordinate approved accommodations with the Disability resources and services office in advance.

Further general information regarding disability resources and services can be found at:

<http://www.ucdenver.edu/student-services/resources/disability-resources-services/accommodations/Pages/accommodations.aspx>

Students can set up an appointment at:

<http://www.ucdenver.edu/student-services/resources/disability-resources-services/about-office/contact-us-CUAnschutz/Pages/form.aspx>

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 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 as directory information, only a limited amount of this information is routinely disclosed by CU Denver 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 <http://www.ucdenver.edu/student-services/resources/registrar/Pages/default.aspx>. 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: student.services@ucdenver.edu

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

<http://www.ucdenver.edu/anschutz/studentresources/Registrar/StudentServices/FERPA/Pages/default.aspx>

Immunization Policy

To ensure that a minimum standard of public health and safety is provided for our faculty and students, all students matriculating into any ColoradoSPH program are required to provide proof of immunizations for measles, mumps, rubella, and tuberculosis using the required forms. The Graduate School Office should receive proof of immunizations at least two weeks prior to the start of a student's first term in the program. Students who do not return the immunization form 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

All students enrolled in one or more credit hour at CU Anschutz 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. Information about student health insurance at CU Anschutz is available here:

<http://www.ucdenver.edu/life/services/student-health/insurance/Pages/default.aspx>

Background Check Policy

Students matriculating into any ColoradoSPH degree-seeking program are required to pass a criminal background investigation. The background check is conducted during the admissions process. 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 the Colorado School of Public Health implies the acceptance of, and adherence to, the 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 reflected by appropriate conduct at all times. The Honor and Conduct Code of UC Denver, and the Academic Appeals Process of the Graduate School also govern Biostatistics Graduate students. Please see the Graduate School Handbook at:

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/GSOCTFORMS/Graduate%20Student%20Handbook.pdf>

Although it is not possible to list every situation that violates the 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 violates these standards include: plagiarism (including the undocumented use of internet and web-based information), cheating, illegitimate possession and/or use of examinations, 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 or study subjects; violation of patient or study subject confidentiality; IRB violations; and any other conduct unbecoming a professional public health practitioner, researcher, or educator.

3. Alcohol and Drug Use

Alcohol and/or drug abuse compromises the student's ability to learn and to practice as a public health professional and thus is considered unprofessional conduct. Students who have a problem with alcohol and/or drugs should seek assistance from services available on campus or elsewhere. The sale of drugs or the possession of narcotics is against the law. To minimize the potential for alcohol abuse at campus functions, students must adhere to current University policy governing the consumption of alcohol on campus. Please note that the new marijuana laws in Colorado do not change existing University of Colorado campus policies that prohibit the possession, use or distribution of marijuana by students, employees and all visitors on university property. For further information, please refer to this website:

http://catalog.ucdenver.edu/content.php?catoid=1&navoid=24#Drugs_and_Alcohol

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 inappropriate behavior include: theft, damages to University or personal property of others, disruption of educational or other activities on campus, illegal use of University facilities, sexual harassment, physical assault, and any conduct that threatens the health or safety of others.

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:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/PoliciesHandbooks.aspx>

Academic Grievance Policy

The Colorado School of Public Health (CSPH) recognizes that a student may have grievances about different aspects of his or her academic program. The CSPH 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 ColoradoSPH Associate Dean for Academic Affairs.

Student Rights

All CSPH Students have the right to:

1. Competent instruction
2. Access to instructors outside of class during a specified set of office hours or by appointment
3. 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
4. Be treated with respect and equality
5. Be treated fairly according to standards stated within the student handbook and each course syllabus

Formal Grievance Process

Step 1

Because the filing of an Academic Grievance is considered a serious matter, the student is strongly encouraged to seek informal resolution first by discussing the matter with the faculty member or administrator involved. The student and faculty/administrator should document the date, time, and outcome of the meeting for future reference. If the student feels he or she needs assistance in discussing or resolving the issue, a University of Colorado Denver Ombudsperson is available to help students facilitate a resolution related to any type of grievance. That office can be reached at 303.724.2950. Additional information about the Ombuds Office can be found on their website:

<http://www.ucdenver.edu/about/departments/OmbudsOffice/Pages/OmbudsOffice.aspx>

Step 2

The student should contact the Chair of the Department to which the faculty member belongs. The Chair and the student will work together to resolve the grievance informally. At their election, the Associate Dean may be asked to facilitate these conversations. The student might seek guidance from the Associate Dean in this step. The Associate Dean will act as a mediator between the student and faculty member to help resolve any miscommunications between the parties.

Step 3

If an informal resolution cannot be reached, the Associate Dean will meet with the student to determine if the grievance is one that can be legitimately pursued through the official grievance process.

Step 4

If the Associate Dean and the student agree to move forward, the Hearing Committee must be constituted within 30 days of indication from the student or the chair that the grievance cannot be resolved at the department level.

Step 5

A report will be prepared by the Associate Dean to include a personal statement from the individual filing the grievance or appeal outlining the grievance or appeal, the date(s) of the alleged incident, and all supporting documentation and evidence. This report will be sent to the faculty member with whom the grievance has occurred.

Step 6

Hearing Committee members shall be contacted to schedule a hearing. All committee members shall commit to being present on the agreed date and time.

Step 7

One week in advance of the hearing, all Hearing Committee members will be informed in writing of the hearing committee composition, the Associate Dean's written report, any other evidence and testimony to be presented, and the resolutions each party believes to be acceptable.

Step 8

On the date of the hearing, each party will be privately and separately interviewed by the Hearing Committee. At that time, any additional information, documentation and testimony regarding the grievance can be introduced. All testimony will be audio recorded for accuracy. The recording will be destroyed at resolution of the grievance.

The Associate Dean, or his/her designee, shall be present at the hearing. The Associate Dean will not have voting power, but will oversee the hearing to ensure procedures are followed, proceedings are conducted with respect for all parties, and that all parties are satisfied that their testimony was presented.

Step 9

All testimony and documentation will be strictly confidential. This confidentiality will be waived only if the grievance hearing results in legal action to the extent that grievance testimony and documentation need to be available to the court. All parties shall be advised that no hearing participant should use any information from the hearing in any way to affect future interactions among the parties.

Step 10

The Hearing Committee will send a formal written recommendation to the Associate Dean of the ColoradoSPH within five (5) working days. The Associate Dean will make a formal recommendation to the Dean based on all of the evidence and testimony within five (5) working days of receipt of the Hearing Committee's recommendation.

Step 11

The Dean's decision will be considered final and binding by all parties.

Step 12

Upon acceptance of the formal decision by the Dean of the ColoradoSPH, the Associate Dean will be notified and will inform all relevant parties of the decision. It is the intent of the ColoradoSPH that all

individuals associated with the ColoradoSPH have the right to bring grievances to the appropriate School officials and that they be granted full opportunity to be heard, treated with respect, and due process as they seek redress of their grievances. The full Academic Grievance policy can be found online at:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/Forms.aspx>

Non-Discrimination Policy Statement

The University of Colorado, including the Colorado School of Public Health, 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 of Colorado and the Colorado School of Public Health 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/regents/Policies/Policy10A.htm>

Sexual Harassment 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:

<http://www.ucdenver.edu/policy/TitleIX/>

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 Disability Services Offices (Sherry Holden, Sherry.Holden@uchealth.org) or the Title IX Coordinator for ColoradoSPH (Jan Gascoigne, Jan.Gascoigne@ucdenver.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@ucdenver.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://4help.oit.ucdenver.edu/CherwellPortal/IT#o>

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 schedule an appointment to pick up their Anschutz Medical Campus ID Badge by calling 303-724-0399. The ID Badge Office is located in Building 500 on the first floor, next to the food court.

Students with a home campus of CSU or UNC should contact their campus education staff to inquire about ID badges on those campuses.

Establishing 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.

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," he or she 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.

For more information regarding establishing residency, please visit:

CU Anschutz Medical Campus Registrar's website:

<http://www.ucdenver.edu/anschutz/studentresources/Registrar/Pages/Registrar.aspx>

Graduate School Handbook:

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/GSOCTFORMS/Graduate%20Student%20Handbook.pdf>

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:

<http://www.ucdenver.edu/anschutz/studentresources/StudentBilling/Pages/default.aspx>

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

<http://www.ucdenver.edu/academics/colleges/PublicHealth/admissionsandaid/Pages/CostofAttendance.aspx>

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 semester's drop/add deadline, full tuition and fees will be refunded. **Courses dropped after the semester's 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.

Appeals for tuition refunds after the drop/add deadline will follow the policy outlined on the Tuition Appeals Form on the ColoradoSPH website:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/Forms.aspx>

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

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/index.aspx>

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.

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 courses at the university. 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. Overall, this is a small proportion of our course offerings (only 8 courses reached their enrollment cap out of more than 50 offered in spring 2014). 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: EPID 6630, HSMP 6603 (and its replacement for spring 2015, HSMP 6601), EHOH 6614, CBHS 6610, PUBH 6600, BIOS 6601, BIOS 6602, and BIOS 6612.

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 on 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.

Beginning in the spring semester 2015, the Colorado School of Public Health will not accept tuition waivers for PUBH 6606 (MPH Practicum) and PUBH 6955 (MPH Capstone Project). These two courses are tailored to the individual student, and require individualized faculty attention to the development of each learning plan/proposal, monitoring of progress, and evaluation of final products. Thus, significant education costs are incurred for each student enrolled. This policy is necessary in order to maintain high standards for our delivery of these two courses.

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.

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:

<http://www.ucdenver.edu/academics/CUOnline/TuitionFees/FinancialAid/Pages/FinancialAid.aspx>

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 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 automatically 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. Meetings with the advisor/mentor should occur at least weekly once work on the thesis/dissertation begins.

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.

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.

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:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/CoursesRegistration.aspx>

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 and requires the approval of the Assistant Dean of the Graduate School.

Inter-campus 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.

Waiving Courses

If a student believes that he/she has covered the content of a required course in previous course work, he/she may request to waive the course. To waive a course, the student consults the instructor teaching the course, bringing evidence of his/her previous work in the subject. With approval from the Instructor, Program Director, and Associate Dean for Academic Affairs, the student can substitute the course requirement with an equivalent number of hours in an elective course or independent study.

Broad Introduction to Public Health Waiver

It is a requirement of the school's accreditation that all ColoradoSPH MS and PhD students receive a broad introduction to public health. This is a curriculum requirement of both the Biostatistics MS and PhD programs. Options to fulfill this requirement are outlined below:

- Foundations in Public Health (PUBH6600- 2 credits) and History of Public Health (EPID 6601- 1 credit)
- Public Health in the Global Community (CBHS 6619- 3 credits)
- Foundations in Public Health (PUBH 6600- 2 credits) and Social and Behavioral Factors and Health (CBHS 6610-3 credits)

Students with a prior MPH degree or equivalent graduate-level coursework may be eligible to waive this requirement. These students must submit a requirement waiver request form to the Office of Academic affairs, documenting the student's eligibility to waive this requirement. The form is available at:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/Forms.aspx>

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 waive the requirement that they take those courses, keeping in mind that all students must satisfy the graduate school's requirement of 30 total credit hours of coursework to complete the MS degree. The following tables list the credit hours required to complete the MS and PhD in Biostatistics.

MS Requirements

Course Requirements	Credits
Required Biostatistics Courses	20 total
Biostatistical Methods I (BIOS 6611)	3
Biostatistical Methods II (Bios 6612)	3
Statistical Consulting I (BIOS 6621)	1
Statistical Consulting II (BIOS 6622)	1
Advanced Data Analysis (BIOS6623)	3
Statistical Theory I (BIOS 6631)	3
Statistical Theory II (BIOS 6632)	3
Longitudinal Data Analysis (BIOS 6643)	3
Required Public Health Courses*	6 total
Foundations in Public Health (PUBH 6600)	2
History of Public Health (EPID 6601)	1
Epidemiology (EPID 6630)	3
Elective Biostatistics Courses**	6 total
Design of Studies in the Health Sciences (BIOS 6649)	3
Statistical Methods in Genetic Association Studies (BIOS 6655)	3
Analysis of Biomedical Big Data Using R and Bioconductor (BIOS 6660)	3
Survival Analysis (BIOS 6646)	3
Python and R Programming in Data Science (BIOS 6640)	3
Thesis/ Research Paper/ Project	4 total
Total Program Credits	36

*The combination of PUBH 6600 and EPID 6601 may be substituted with CBHS 6619 (Public Health in the Global Community) – 3 credits

** 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 Track in Statistical Genomics and Genetics

With this track, students pursuing the MS Biostatistics program will have an official designation of specialization in this area, which will help with employment and other opportunities. A separate document outlining the track and the requirements will be provided by the Program Directors. Briefly, students pursuing training in the new track are required to:

1. Select three electives (9 credits) from a list of courses related to statistical genetics/genomics (with at most 3 credits from an outside department). Two of these electives (6 credits) will satisfy the requirements of the MS degree.
2. Write a thesis or publishable paper with focus on Statistical Genomics and Genetics.

Contact the Program Directors and the Academic Affairs Specialist if you intend to pursue this track, and after completion so that 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:

Competency Areas		
Study Development Work collaboratively with biomedical or public health researchers and PhD biostatisticians, as necessary, to provide biostatistical expertise in the development and design of research studies.		
Specific Competency	Learning Opportunities	Evaluation Opportunities
Map study aims to testable statistical hypotheses.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6643, 6646, 6649, 6655 • Master's Thesis/Paper • Research Assistantship • Seminar 	<ul style="list-style-type: none"> • Coursework & Exams • Written Master's Thesis/Paper • Oral Thesis/Paper Proposal • Oral Thesis/Paper Defense
Identify the strengths and weaknesses of various clinical trial and observational study designs and the data collection methods that go with these designs	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6643, 6646, 6649, 6655 • EPID 6630 • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • MS Qualifying Exam • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense

Use probability and statistical theory to develop appropriate data analysis plans for study hypotheses.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6623, 6631, 6632, 6643, 6646, 6649, 6655 • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Modeling and analysis Develop, carry out, and report biostatistical modeling and analysis of biological science and public health studies.		
Specific Competency	Learning Opportunities	Evaluation Opportunities
Use advanced techniques for summary and visualization of complex data for exploratory analysis and presentation.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6643, 6646, 6649, 6655 • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • MS Qualifying Exam • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Use probability and statistical theory to identify appropriate modeling and analysis methods to address study hypotheses.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6623, 6631, 6632, 6643, 6646, 6649, 6655 • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • MS Qualifying Exam • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Determine and check modeling assumptions, and verify validity of proposed analyses.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6631, 6632, 6643, 6646, 6655 • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • MS Qualifying Exam • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Carry out valid and efficient modeling, estimation, and inference to address study hypotheses, using standard statistical methods including basic one and two sample methods, general linear models including regression and anova, logistic regression, and clustered and longitudinal analysis.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6622, 6623, 6643, 6646, 6655 • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • MS Qualifying Exam • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Read biostatistical literature to determine and implement alternate methods of analysis.	<ul style="list-style-type: none"> • BIOS 6621, 6622, 6623, 6631, 6632 • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Demonstrate statistical programming proficiency, good coding style and use of reproducible research principles in leading statistical software.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6643, 6646, 6649, 6655, 6660 	<ul style="list-style-type: none"> • Coursework & Exams • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense

Biologic or Public Health Relevance Show how biostatistical tools apply to and influence research and policy in the biomedical and public health arenas		
Specific Competency	Learning Opportunities	Evaluation Opportunities
Read subject specific biomedical or public health literature and synthesize issues that are important in the design, implementation, and analysis of research in the subject area.	<ul style="list-style-type: none"> • BIOS 6621, 6623 • PUBH 6600 • Other Elective courses outside Biostatistics • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Apply basic ethical concepts of public health policy and practice, ensure the quality and security of information used in a study and adhere to the principles of research ethics.	<ul style="list-style-type: none"> • BIOS 6621, 6622, 6623, 6649 • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Develop and implement specialized study designs and analyses in biological (e.g. genetic association, genomics) or public health (e.g. epidemiological) settings.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6623, 6643, 6646, 6655, 6660 • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Coursework & Exams • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Communication Communicate orally and in writing biostatistical concepts and results to both biostatistical and non-biostatistical audiences		
Specific Competency	Learning Opportunities	Evaluation Opportunities
Communicate orally and in writing simple and complex statistical ideas and methods to collaborators in non-technical terms including preparation of analysis section of grant proposals and methods and results sections of manuscripts.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6643, 6646, 6655 • Master's Thesis/Paper • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • MS Qualifying Exam • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense
Manage the preparation of large documents (e.g. grant proposals or manuscripts).	<ul style="list-style-type: none"> • Master's Thesis/Paper • Research Assistantship 	<ul style="list-style-type: none"> • Oral Thesis/Paper Proposal • Written Master's Thesis/Paper • Oral Thesis/Paper Defense

PhD Requirements

Course Requirements	Credits
Required MS Biostatistics Courses	20
Elective MS Biostatistics Courses	6
Required Public Health Courses*	6
Foundations in Public Health (PUBH 6600)	2
History of Public Health (EPID 6601)	1
Epidemiology (EPID 6630)	3
Required PhD Biostatistics Courses	6
Advanced Mathematical Statistics I (BIOS 7731)	3
Advanced Mathematical Statistics II (BIOS 7732)	3
Elective PhD Biostatistics Courses**	9
Statistical Methods in Genomics (BIOS 7659)	3
Analysis of Correlated Data (BIOS 7712)	1
Statistical Methods for Missing Data (BIOS 7713)	2
Advanced Statistical Computing (BIOS 7714)	3
Stochastic Modeling (BIOS 7715)	2
Topics in Statistical Genetics (BIOS 7716)	1
Bayesian Biostatistical Methods (BIOS 7717)	3
Elective Health Sciences Courses	3
Dissertation	30
Biostatistics Dissertation (BIOS 8990)	30
Total Program Credits	80

*The combination of PUBH 6600 and EPID 6601 may be substituted with CBHS 6619 (Public Health in the Global Community) – 3 credits

** 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 UC Denver MS program.

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. Courses in epidemiology beyond the required EPID 6630, as well as courses in Statistical Genetics can often be

used towards the medical science electives. Selection of health science electives is subject to approval of the Program Director.

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:

Competency Area		
Collaboration Work collaboratively with biomedical or public health researchers on the design, implementation, data analysis, and dissemination of research studies.		
Specific Competency	Learning Opportunities	Evaluation Opportunities
Write or modify study aims so that the aims map to testable hypotheses.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6643, 6646, 6649, 6655, PhD elective courses • Dissertation • Professional meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • PhD Preliminary Exam • PhD Qualifying Exam • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Develop and refine the design of studies including appropriate formulation of the study aims, parameterization of the underlying research questions, and evaluation of study information requirements (sample size). Modify and develop new study designs when existing/initial approaches are inadequate.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6643, 6646, 6649, 6655, PhD elective courses • Dissertation • Professional meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • PhD Preliminary Exam • PhD Qualifying Exam • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Identify, implement, and correctly interpret appropriate data analysis approaches for study aims, and suggest new methods when	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6643, 6646, 6649, 6655, PhD elective courses • Dissertation • Professional meetings 	<ul style="list-style-type: none"> • Coursework & Exams • PhD Preliminary Exam • PhD Qualifying Exam • Written Dissertation • Oral Dissertation Defense

existing approaches are inadequate.	<ul style="list-style-type: none"> • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Research Assistantship
Obtain basic understanding of biomedical or public health subject matter for collaborative project	<ul style="list-style-type: none"> • EPID 6630, PUBH 6600 • Health Sciences Electives • Statistical genetics/genomics electives • Dissertation • Professional meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Establish and foster effective communication with non-statistician collaborators in written, graphical and verbal forms during the lifetime of the project	<ul style="list-style-type: none"> • Dissertation • Professional meetings • Research Assistantship 	<ul style="list-style-type: none"> • Written Dissertation • Oral Dissertation Defense • Research Assistantship

Biostatistical Research Develop and disseminate new biostatistical design, estimation, or hypothesis testing approaches		
Specific Competency	Learning Opportunities	Evaluation Opportunities
Read (bio) statistical literature on a subject area and synthesize the strengths and weaknesses of existing research.	<ul style="list-style-type: none"> • BIOS 6622, 6623, 7731, 7732, PhD elective courses • Dissertation • Professional meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Use statistical theory and biological/public health knowledge to propose new statistical methods to solve statistical problems deriving out of biomedical/public health research.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6623, 6631, 6632, 6643, 6646, 6649, 6655, 7731, 7732, PhD elective courses • Dissertation • Professional Meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • PhD Preliminary Exam • PhD Qualifying Exam • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Use appropriate theory or design and implement appropriate simulation studies to exhibit that new methodology has sound statistical features.	<ul style="list-style-type: none"> • BIOS 6623, 6643, 6646, 6649, 6655, 7731, 7732, PhD elective courses • Dissertation • Professional Meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • PhD Preliminary Exam • PhD Qualifying Exam • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Apply new statistical methodology to real data problems in biomedical or public health research.	<ul style="list-style-type: none"> • PhD elective courses • Dissertation • Professional Meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • PhD Qualifying Exam • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Apply and develop statistical and numerical computing algorithms as related to the development of new methodology.	<ul style="list-style-type: none"> • BIOS 6646, PhD elective courses • Dissertation • Professional Meetings 	<ul style="list-style-type: none"> • Coursework & Exams • PhD Qualifying Exam • Written Dissertation • Oral Dissertation Defense

	<ul style="list-style-type: none"> • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Research Assistantship
Communicate effectively in written, graphical and verbal forms with biostatisticians. Use advanced techniques for summary and visualization of complex data for exploratory analysis and presentation.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6631, 6632, 6643, 6646, 6649, 6655, 7731, 7732, PhD elective courses • Dissertation • Professional Meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • PhD written exam • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Demonstrate statistical programming proficiency, good coding style and use of reproducible research principles in leading statistical software.	<ul style="list-style-type: none"> • BIOS 6611, 6612, 6621, 6622, 6623, 6643, 6646, 6649, 6655, 6660, PhD elective courses • Dissertation • Professional Meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • PhD Qualifying Exam • Written Dissertation • Oral Dissertation Defense • Research Assistantship

Biologic or Public Health Relevance Show how biostatistical tools apply to and influence research and policy in the biomedical and public health arenas		
Specific Competency	Learning Opportunities	Evaluation Opportunities
Read subject specific biomedical or public health literature and synthesize issues that are important in the design, implementation, and analysis of research in the subject area.	<ul style="list-style-type: none"> • Dissertation • Professional Meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Understand ethical aspects of public health policy and practice, ensure the quality and security of information used in a study and adhere to the principles of research ethics.	<ul style="list-style-type: none"> • BIOS 6621, 6622, 6623, 6649, PhD elective courses • Dissertation • Professional Meetings, • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Identify areas in a specific biomedical or public health area where existing or new statistical approaches might transform the conduct of research or conclusions derived from research in that area.	<ul style="list-style-type: none"> • Dissertation • Professional Meetings • Research Assistantship • Seminars 	<ul style="list-style-type: none"> • Written Dissertation • Oral Dissertation Defense • Research Assistantship
Communication Communicate and teach biostatistical concepts to both biostatistical and non-biostatistical audiences		
Specific Competency	Learning Opportunities	Evaluation Opportunities
Communicate orally and in writing simple and complex statistical	<ul style="list-style-type: none"> • BIOS 6621, 6622, 6623 • Dissertation 	<ul style="list-style-type: none"> • Written Dissertation • Oral Dissertation Defense

ideas and methods to collaborators in non-technical terms.	<ul style="list-style-type: none"> • Professional Meetings • Research Assistantship • Teaching Assistantship • Seminars 	<ul style="list-style-type: none"> • Research Assistantship • Teaching Assistantship
Identify biostatistical knowledge and skills needed by collaborators, and develop materials to communicate that knowledge.	<ul style="list-style-type: none"> • All coursework • Dissertation • Research Assistantship • Teaching Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • Written Dissertation • Oral Dissertation Defense • Research Assistantship • Teaching Assistantship
Identify biostatistical knowledge and skills needed by peers to understand a specific subject area, and develop materials to communicate that knowledge.	<ul style="list-style-type: none"> • All coursework • Dissertation • Research Assistantship • Teaching Assistantship • Seminars 	<ul style="list-style-type: none"> • Coursework & Exams • Written Dissertation • Oral Dissertation Defense • Research Assistantship • Teaching Assistantship

MS and PhD Qualifying Examinations

MS and PhD students will take a written departmental examination at the end of their Year 1 course work covering material from BIOS 6611-6612 and BIOS 6631-6632. This examination will be administered once a year, generally in June. Passing at the MS level is a requirement for completion of the MS program. Passing at the PhD level is a requirement for the PhD program. This is the Graduate School Preliminary Examination for PhD students. Please see Graduate School rules for more information:

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/pdf/Consolidated-Rules.pdf>

A student who fails the examination 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 the examination may retake it once.

PhD students take a second qualifying exam when they have completed all of their biostatistics coursework. This is not an official Graduate School exam, but passing is a requirement for the PhD program. The same rules for re-taking the exam 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, will be considered for admission to the PhD program by the program 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 Proposal

After successful completion of the qualifying 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 student then gives a short (~30 minute) presentation of the proposal to the committee (this is not a formal Graduate School exam). When the proposal is approved by the committee, the members of the committee sign the proposal acceptance form found at:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/Forms.aspx>

The acceptance form is forwarded to the Academic Affairs Specialist and placed in the student's file along with a copy of the proposal. Minutes of the regular committee meetings are forwarded to the Academic Affairs Specialist for the student's file to document progress in their research. 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.

Application for Admission to Candidacy

Students must complete the application for admission to candidacy for the MS degree. The student obtains signatures from the Advisor and Chair of the MS exam committee. The student then forwards the form to the Program Director for verification of the courses listed that are to be applied towards the degree and signature. The student then submits the form to the Academic Affairs Specialist **at least five weeks in advance, and by the Graduate School deadline for that term, whichever is earlier,** before scheduling the final exam. Once all signatures have been obtained the Academic Affairs Specialist will submit the form to the Graduate School **at least one month** prior to the exam or **by the Graduate School deadline for that term, whichever is earlier.** The required form can be obtained from the Graduate School website:

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/GSOCTFORMS/Application%20for%20Candidacy.pdf>

To apply for graduation, students must have passed the written qualifying exam at the MS level. In addition to the Application for Admission to Candidacy, students must also submit an "Intent to Graduate" form through the UCD Access student portal before the posted deadline for the graduation semester.

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 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 Request for Graduate Examination/Thesis Defense form is required. Students must obtain the Program Director's signature on the form. Students then submit the form to the Academic Affairs Specialist **at least three weeks** before the exam date. The Academic Affairs Specialist will submit the form to the Graduate School **at least two weeks** prior to the exam. The Request for Graduate Examination/Thesis Defense form can be found on the Graduate School website.

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/GSOCTFORMS/Request%20for%20Exam.pdf>

All Graduate School guidelines and specifications must be followed. In particular, if choosing the thesis option, the student must meet with the Assistant Dean of the Graduate School *before* the final exam to go over formatting of the thesis. Please schedule your thesis pre-check up to two weeks in advance, to allow time to get onto the Assistant Dean of the Graduate School's calendar. To schedule an appointment with the Assistant Dean of the Graduate School, please contact the Graduate School Office at 303-724-2911.

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. 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 "Intent to Graduate" form through the UCD Access student portal by the specified deadline.

Ceremonies

A campus-wide commencement ceremony is held once a year in May on the CU Anschutz Medical Campus. All graduates for that academic year plus the following summer are invited to attend. Students graduating in May or the previous August or December can attend the Graduate School graduation ceremony. The graduation ceremony is usually held on the last Friday in May. In addition, the ColoradoSPH offers a separate Convocation ceremony 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 a bound (hard or soft) copy of the thesis, or a printed copy of the research paper, be provided for the department.

PhD Program Guidelines

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. Minutes of the committee meetings are forwarded to the Academic Affairs Specialist for the student's file to document progress in their research. 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 obtains signatures from the Advisor and Chair of the PhD committee. The student then forwards the form to the Program Director for verification of the courses listed that are to be applied towards the degree and signature. The student then submits the form to the Academic Affairs Specialist **at least five weeks in advance, and by the Graduate School deadline for that term, whichever is earlier**, before scheduling the comprehensive exam. Once the student obtains all signatures the Academic Affairs Specialist will submit the form to the Graduate School **at least one month** prior to the exam or **by the Graduate School deadline for that term, whichever is earlier**. The required form can be found on the Graduate School website:

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/GSOCTFORMS/Application%20of%20Candidacy.pdf>

Scheduling the Comprehensive Exam

The Request for Graduate Examination/Thesis Defense form is required to schedule the comprehensive exam. Students must obtain the Program Director's signature on the form. Students then submit the form to the Academic Affairs Specialist at least three weeks before the exam date. The Academic Affairs Specialist will submit the form to the Graduate School at least two weeks prior to the comprehensive exam date. The Request for Graduate Examination/Thesis Defense form can be found on the Graduate School website.

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/GSOCTFORMS/Request%20of%20Exam.pdf>

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. One member, but not the chairperson or the student, may participate by interactive video. 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:

<http://www.ucdenver.edu/academics/colleges/Engineering/Programs/bioengineering/GraduateProgram/Pages/Forms.aspx>

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 defense.

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 dissertation defense is during the summer semester, the student must register for 5 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. Students must submit meeting minutes/notes to the Academic Affairs Specialist to be kept in their file.

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 Request for Graduate Examination/Thesis Defense form is required to schedule the dissertation defense. Students must obtain the Program Director's signature on the form. Students then submit the

form to the Academic Affairs Specialist **at least three weeks** before the exam date. The Academic Affairs Specialist will submit the form to the Graduate School **at least two weeks** prior to the dissertation defense date.

The Request for Graduate Examination/Thesis Defense form can be found on the Graduate School website.

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/GSOCTFORMS/Request%20for%20Exam.pdf>

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.

Note: *Students must meet with the Assistant Dean of the Graduate School before the defense for a mandatory thesis pre-check.* Please schedule your thesis pre-check two weeks in advance, to allow time to get onto the Assistant Dean of the Graduate School's calendar. To schedule an appointment with the Assistant Dean of the Graduate School, please contact the Graduate School Office at 303-724-2911.

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. One member, but not the chairperson or the student, may participate by interactive video. 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 a bound copy (soft or hard) of the dissertation be provided for the department.

Biostatistics Faculty

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

<http://www.ucdenver.edu/academics/colleges/Graduate-School/current/Pages/amc-faculty.aspx>

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. The following is a list of faculty members that can be committee chairs or mentors:

Anna Barón	Katerina Kechris
Nichole Carlson	John Kittelson
Diane Fairclough	Sharon Lutz
Tasha Fingerlin	Samantha MaWhinney
Debashis Ghosh	Laura Saba
Deborah Glueck	Matt Strand
Gary Grunwald	Brandie Wagner
John Hughes	Gary Zerbe
Elizabeth Juarez-Colunga	

A MS or PhD committee must have an odd number of members, with a majority from the above list. A PhD committee must have at least one member not on the above list, preferably someone from another discipline.

Organization & Content of Courses

Below is a list of courses offered by the Department of Biostatistics and Informatics. Brief descriptions, terms offered, etc., can be found in the course book:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/CoursesRegistration.aspx>
<http://www.ucdenver.edu/academics/colleges/publichealth/academics/academics/pages/coursesregistration.aspx>

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

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

Designation	Course #	Name	Credits
N	BIOS 6601	Applied Biostatistics I	3
N	BIOS 6602	Applied Biostatistics II	3
N	BIOS 6603	Statistical Computing – SAS	1
N	BIOS 6604	Statistical Computing – SPSS	1
N	BIOS 6605	Statistical Computing - R	1
N	BIOS 6606	Statistics for the Basic Sciences	1
M	BIOS 6611	Biostatistical Method I	3
M	BIOS 6612	Biostatistical Methods II	3
M	BIOS 6621	Biostatistical Consulting I	1

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M	BIOS 6622	Biostatistical Consulting II	1
M	BIOS 6623	Advanced Data Analysis	3
N	BIOS 6628	Latent Variable Analysis	3
N	BIOS 6629	Applied Survival & Longitudinal Data Analysis	3
M	BIOS 6631	Statistical Theory I	3
M	BIOS 6632	Statistical Theory II	3
EM	BIOS 6640	Python and R Programming in Data Science	3
M	BIOS 6643	Analysis of Longitudinal Data	3
EM	BIOS 6646	Survival Analysis	3
N	BIOS 6648	Design & Conduct of Clinical Research	3
EM	BIOS 6649	Design of Studies in the Health Sciences	3
	BIOS 6650	MPH Research Paper	1 – 2
	BIOS 6651	Masters Research Paper	1 – 6
EM	BIOS 6655	Statistical Methods in Genetic Association Studies	3
EM	BIOS 6660	Analysis of Biomedical Big Data Using R and Bioconductor	2
	BIOS 6670	Special Topics: Biostatistics	1 – 3
N	BIOS 6680	SAS Database Design/Management	3
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	BIOS 7659	Statistical Methods in Genomics	3
	BIOS 7670	Advanced Special Topics – Biostatistics	1 – 3
EP	BIOS 7712	Statistical Methods for Correlated Data	1
EP	BIOS 7713	Statistical Methods for Missing Data	2
EP	BIOS 7714	Advanced Statistical Computing	3
EP	BIOS 7715	Stochastic Modeling	2
EP	BIOS 7716	Topics in Statistical Genetics	1
EP	BIOS 7717	Bayesian Biostatistical Methods	3
P	BIOS 7731	Advanced Mathematical Statistics I	3
P	BIOS 7732	Advanced Mathematical Statistics II	3
	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	3

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Appendix I

Biostatistics MS and PhD Comprehensive and Final Exam Rules and Checklists

All Exams

The student should see the program Co-Directors Gary Grunwald or Katerina Kechris 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 6 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.
- One member, not the chair or student, may participate in the final exam (defense) via interactive videoconference.
- 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 6 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.
- One member, not the chair or student, may participate in comprehensive and final exams via interactive videoconference.
- 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 "Intent to Graduate" form through the UCD Access student portal.
- At least 1 month before scheduling the exam, or March 1 for May graduation, June 1 for August graduation, or October 1 for December graduation, *whichever comes first*: File the *Application for Admission to Candidacy Form*.
- At least 6 months before exam: Request any graduate faculty appointments.
- At least 3 weeks before exam: File Request for Graduate Examination/Thesis Defense 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).

Chair

- Before exam: Get exam paperwork and student's file from the Academic Affairs Specialist.
- After exam: Return exam paperwork and student's file to the Academic Affairs Specialist.

PhD Comprehensive (Oral) Exam

Student

- This exam should be done no later than one year after completing the PhD written 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 6 months before exam: Request any graduate faculty appointments.
- At least 3 weeks before exam: File "Application for Admission to Candidacy" form.
- At least 3 weeks before exam: File "Request for Graduate Examination/Thesis Defense" form."
- At least 3 weeks before exam: Get proposal to committee.

Chair

- Before exam: Get exam paperwork and student's file from the Academic Affairs Specialist.
- After exam: Return exam paperwork and student's file to the Academic Affairs Specialist.
- After exam: Place a copy of the approved proposal in the student's file.

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 6 months before exam: Request any new graduate faculty appointments.
- At least 3 weeks before exam: File Request for Graduate Examination/Thesis Defense form.
- 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 a 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 and student's file from the Academic Affairs Specialist. There are two forms to be signed by the committee, one giving results from the exam and one approving the dissertation. The first should be with the file, the latter the student should bring to the defense.
- After exam: Return exam paperwork and student's file to the Academic Affairs Specialist.

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 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 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 Co-Directors 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 Co-Directors. 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 co-directors 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.

Written qualifying exams (June each year)

MS

For an MS degree, the first qualifying exam must be passed at the MS level. Students should plan to take the first exam as soon as they have completed the required courses (BIOS 6611/12 and BIOS 6631/32).

PhD

For a PhD degree, the first qualifying exam must be passed at the PhD level. This is the official Graduate School Preliminary exam. The second qualifying exam must also be passed. Students should plan to take the second exam as soon as they have completed the required biostatistics courses. Students entering the program with an MS degree from another university are required to take the qualifying exam at the end of their first year.

Students who do not pass a qualifying exam may, depending on the quality of their other work in the program, be allowed to re-take the exam.

Students are encouraged to begin talking with potential supervisors as soon as possible after entry into the program, and do not have to wait until taking or passing these qualifying 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 qualifying 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 sort of 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 (maximum of six semester hours) of thesis or research paper. If in the semester a student takes the final examination (defense) s/he already has registered for six semester hours of thesis and has completed all other course work, s/he must then register for Candidate for Degree (CAND 6940). This course does not apply to any graduation credit requirements.

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 from the Assistant Dean of the Graduate School.

2. **Form a committee.** When you and your likely supervisor are fairly confident you have a good topic or specific area to work in, 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 (sometimes referred to as supervisor or mentor) typically guides the research. All members of the committee must be present for the comprehensive and final examinations. One member, but not the chairperson or the student, may participate by interactive video. All members of MS and PhD committees must have appointments in the UCD graduate school. Faculty from other schools or universities is 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 Co-Biostatistics Program Directors) 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 co-program directors.

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. Get your proposal approved by your committee.

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 four 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. 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 would 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. It is good to meet with the Assistant Dean of the Graduate School when you begin formatting the thesis or dissertation to make sure the setup is accurate. The MS Research Paper must be in a form to be submitted to a journal.
7. **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. 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. MS 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. One member, but not the chairperson or the student, may participate by interactive video. If a student passes the examination with conditions, those conditions must be satisfied within four months for the MS degree and 60 days for the PhD degree. Graduation packets containing all necessary paperwork are available on the Graduate School website:

<http://www.ucdenver.edu/academics/colleges/Engineering/Programs/bioengineering/GraduateProgram/Pages/Forms.aspx>

Instructions are included. The packet should be downloaded approximately 6 months in advance of your anticipated graduation date.