Immunology Graduate Program

SCHOOL OF MEDICINE

UNIVERSITY OF COLORADO **ANSCHUTZ MEDICAL CAMPUS**

2023-2024 Student Handbook

Introduction

Welcome to the Graduate Program in Immunology at the University of Colorado Anschutz Medical Campus. This handbook provides information about the Immunology Graduate Program and is designed to complement Graduate School Student policies. Please refer to the Graduate School webpage for specific Graduate School and Office of Research Education policies and procedures.

The material contained within this handbook is as current as possible and describes the Immunology Program specific policies and procedures that ***supersede*** those outlined by the Graduate School. Please be aware that our program continues to evolve. Hence, specific policies may be altered and material here may not always be current.

This handbook, which includes policies and procedures for the Immunology Graduate Program, is provided to serve as firm guidelines rather than absolute rules. Exceptions may be made in the event of an extenuating circumstance. This handbook does not constitute a contract with the Immunology Graduate Program, the Department of Immunology & Microbiology, or the University of Colorado Denver Anschutz Medical Campus, or Graduate School, either expressed or implied. The Immunology Graduate Program reserves the right at any time to change, delete, or add to any of the provisions at its discretion with approval from the Program Directors and/or the steering committee members. Any exceptions to the the Immunology Graduate Program policies contained herein require approval by the Directors of the Immunology Graduate Program. Additional information can be found at the Program website: https://cuanschutz.edu/graduate-programs/immunology/home

The Graduate School policies can be found here:
https://graduateschool.cuanschutz.edu/docs/librariesprovider138/denver-anschutz-graduate-school/resources/graduate-school-policies-and-procedures-mar2022.pdf?sfvrsn=be3a83ba_2

The Office of Research Education polices can be found here:
https://medschool.cuanschutz.edu/ore/forms-and-resources
The Graduate School Course Book by the University of Colorado Anschutz Medical Campus can be found at https://cuanschutz.edu/registrar/catalog

Before the first day of class, all new graduate students should attend the University of Colorado Anschutz Medical Campus orientation. This orientation is mandatory and will provide you with valuable information regarding student insurance, research ethics and animal facility training.

Students are responsible for knowing the procedures, policies and requirements outlined in all these publications.

Contact the Immunology Program Administrator or the Immunology graduate Program Directors, with any questions.
danielle.romanello@cuanschutz.edu
beth.tamburin@cuanschutz.edu
ross.kedl@cuanschutz.edu

Graduate Program Staff

Immunology PhD Program
University of Colorado Anschutz Medical Campus
Graduate Program in Immunology
Aurora, CO 80045

Ross Kedl, Ph.D., Program Co-Director
Ross.kedl@cuanschutz.edu
RC1N-8130

Beth Tamburini, Ph.D., Program Co-Director
Beth.tamburini@cuanschutz.edu
RC2-10122

Danielle Romanello, Program Administrator
danielle.romanello@cuanschutz.edu
Fitzsimons Building-W5108

Office of Research Education
University of Colorado Anschutz Medical Campus 303-724-8025
School of Medicine
Campus Box C290
Fitzsimmons Building, Room E1354
13001 E. 17th Place
Aurora, CO 80045
Email: som-ore@cuanschutz.edu

Angie Ribera, Ph.D., Associate Dean of Research Education
angie.ribera@cuanschutz.edu

Andrew Bradford, Ph.D., Assistant Dean of Student Affairs
andy.bradford@cuanschutz.edu

Jodi Cropper, Business Services Program Director jodi.cropper@cuanschutz.edu

Current Immunology Program PhD Students

	Name	***Matriculation Year***	***Lab/PI/Mentor***
1	Chung, Jeffrey	2016 (BSP)	Jacobelli
2	Cimons, Jennifer	2017 (BSP)	Fry
3	Liu, Victor	2017 (BSP)	Hsieh
4	Willett, Benjamin	2017	Kedl

5	Brown, Alex	2018	Marrack – NJH
6	DeGolier, Kole	2018	Fry
7	DeVoe, Stephanie	2018	Scott Browne
8	Doan, Thu “Autumn”	2018	Tamburnini
9	Heiden, Dustin	2019	Beckham
10	King, Emily	2019 (MSTP)	Janassen / Henson
11	McCaleb, Megan	2019 (BSP)	Pelanda
12	Seymour, Brenda	2019 (MSTP)	Kuhn
13	Sigler, Ashton	2019	Jacobelli
14	Ware, Brian	2019	Morrison

15	Abushawish, Marwan	2020	Scott Browne
16	D’Antonio, Marc	2020	Torres
17	DiLisio, James	2020	Haskins
18	Kantheti, Uma	2020 (MSTP)	Tamburini
19	Kashyap, Amita	2020 (MSTP)	Reinhardt
20	Leaton, Laura Ann	2020	Norman
21	Danielson, Sarah	2020	Kuhn
22	Albert, Gabriella	2021	Davila
23	Belfon, Robert	2021 (BSP)	Tamburini
24	Cedrone, Lena	2021	Haskins
25	Chaudhury, Uddeep	2021	Berg
26	Foster, Mary (MJ)	2021	Berg
27	Gomez, Brittany	2021	Van Dyk
28	Good, Marina	2021	Guthmiller
29	Magno, Joseph	2021	Davila
30	Rios-Guzman, Nasha	2021 (BSP)	Nakayama
31	Riveria-Reyes, Amalia	2021	Fry
32	Stumpf, Megan	2021	Morrison
33	Beynor, Jessica	2022 (MSTP)	Karam
34	Cohen, Rachel	2022 (MSTP)	Colgan
35	Cowan, Courtney	2022	Pietras
36	Fang, Qian	2022	Rincon
37	Good, Marina	2022	Guthmiller
38	Harbell, Michael	2022	Kedl
39	Hilliard, Brandon	2022 (MSTP)	Smith
40	Manes, Cameron	2022	Kedl
41	Olivias-Corral, Jesscia	2022 (BSP)	Tamburini
42	Stenske, Sarah	2022	Scott Browne

43	Trujillo, Emma	2022	Ost
44	Ye, Kimmy	2022	Evans
45	Bedrosian, Zoe	2023	Rotating
46	Fleck, Jeremy	2023	Rotating
47	Gadwa, Jacob	2023	Karam
48	Lee, Jessica	2023	Rotating
49	Lim, Laura	2023	Rotating
50	Miranda, Anjelica	2023	Rotating
51	Mansoor, Mohammad	2023	Rotating
52	Olsen, Valerie	2023	Rotating

Committees and Officers

Admissions Committee

Rachel Friedman PhD, Co-Chair
James Scott-Browne, PhD, Co-Chair
Beth Tamburini, PhD
Ross Kedl, PhD
Raul Torres, PhD
Andrew Getahun, PhD

Steering Committee

Leslie Berg, PhD- Preliminary Exam Chair
Eric Clambey, PhD- Comprehension Exam Chair
Sarah Clark, PhD- ORE Graduate School Council
Rachel Friedman, PhD- Admissions co-Chair
Bill Janssen, PhD- Faculty Recruitment/retention co-Chair
Ross Kedl, PhD- co-Program Director
Kristine Kuhn, PhD- ORE Graduate Council
Laurel Lenz, PhD- T32 Liaison
Lee Reinhardt, PhD- Sac 2+ Chair
James Scott-Browne, PhD- Admissions co-Chair
Jill Slansky, PhD- Curriculum Chair
Mia Smith, PhD- Faculty Recruitment/retention co-Chair
Beth Tamburini, PhD- SAC 1st Year Chair, co-Program Director
Raul Torres, PhD- T32 Liaison

Student Officers 2023-2024

Steering committee/IGSB director – Sarah Danielson
Student Advisory Committee – Uddeep Chaudhury (2nd Year), MJ Foster, Sarah Stenske (1st Year)

Student Recruitment Committee – Joey Magno, Emma Trujillo
Student Curriculum Committee– Gabi Albert, Michael Harbell, Brittney Gomez
Immunology Guest Speaker Contact– Lena Cedrone
Faculty Recruitment and Engagement – Uma Kantheti
Secretary – Courtney Cowan
Journal Club Officer – Cammy Manes
Event/Retreat officers – Megan Stumpf, Kimmy Ye
MSTP Liaison – Brenda Seymour
NJH Liaison – Bridget Alexander
BSP Liaison – Nasha Rios-Guzman
ORE representatives – Marina Good, Laura Ann Leaton

Immunology Graduate Program Faculty

Training faculty in the Immunology graduate program are expected to actively participate in teaching and service activities as a condition of their appointment. Examples of participation include lecturing in or directing an Immunology course, serving on Immunology PhD student thesis committees (including those for student comprehensive exams), serving on other program committees, attending research in progress (RIP) presentations and retreats, attending events associated with student recruitment, and/or other Immunology student-focused activities. The program faculty appointment committee regularly surveys training faculty to confirm they remain active in the program and thus eligible for continuation of their appointment. Faculty listed below are currently active in program activities.

Rafeul Alum, Professor-Department of Medicine, Division of Allergy and Clinical Immunology
Rafeul.alum@cuanschutz.edu

Scott Alper, Associate Professor- Department of Immunology and Microbiology
scott.alper@cuanschutz.edu or alpers@njhealth.org

Jeffrey Bennet, Professor-Department of NeurologyJeffrey.bennett@cuanschutz.edu
Leslie Berg, Professor and Chair- Department of Immunology and Microbiology
Leslie.Berg@CUAnschutz.edu

Eric Clambey, Associate Professor- Department of Anesthesiology
eric.clambey@cuanschutz.edu

Sarah Clark, Assistant Professor- Department of Otolaryngology
Sarah.Clark@cuanschutz.edu

Sean P. Colgan, Professor- Department of Medicine, Division of Gastroenterology and Hepatology
sean.colgan@cuanschutz.edu

Shaodong Dai, Associate Professor- School of Pharmacy & Pharmaceutical Sciences
shaodong.dai@cuanschutz.edu

Kevin Deane, Professor- Department of Medicine, Division of Rheumatology
Kevin.deane@cuanschutz.edu

Howard W. Davidson, Associate Professor - Department of Pediatrics, Section of Pediatric Endocrinology
howard.davidson@cuanschutz.edu

Eduardo Davila, Professor- Department of Medicine, Division of Medical Oncology
eduardo.davila@cuanschutz.edu

James DeGregori, Professor- Department of Biochemistry and Molecular Genetics
james.degregori@cuanschutz.edu

Hans Dooms, Assistant Professor- National Jewish Health – Department of Immunology and Genomic Medicine doomsh@njhealth.org

Kelly Doran, Professor- Department of Immunology and Microbiology
kelly.doran@cuanschutz.edu

Gregory P. Downey, Professor of Medicine- National Jewish Health – Department of Immunology and Genomic Medicine gregory.downey@cuanschutz.edu or downeyg@njhealth.org

Stephen Dreskin, Professor of Medicine- Department of Medicine, Division of Allergy, Asthma and Clinical Immunology
stephen.dreskin@cuanschutz.edu

Patricia Ernst, Professor- Department of Pharmacology
Patricia.ernst@cuanschutz.edu

Christopher Evans, Professor- Department Medicine, Division of Pulmonary Sciences and Critical Care Medicine
christopher.evans@ucdenver.edu

Rachel S. Friedman, Associate Professor- Department of Immunology and Microbiology, Barbara Davis Center for Diabetes rachel.s.friedman@cuanschutz.edu

Brian Freed, Professor- Department of Medicine, Division of Allergy and Clinical Immunology
Brian.freed@cuanschutz.edu

Terry J. Fry, Professor - Department of Pediatrics, Division Hematology, Oncology & Bone Marrow Transplantation
terry.fry@cuanschutz.edu

Mayumi Fujita, Professor of Medicine- Department of Dermatology
mayumi.fujita@cuanschutz.edu

Laurent Gapin, Professor- Department of Immunology and Microbiology
laurent.gapin@cuanschutz.edu

Andrew Getahun, Assistant Professor- Department of Immunology and Microbiology
Andrew.Getahun@CUAnschutz.edu

Magdalena Gorska, Associate Professor of Medicine- National Jewish Health – Department of Immunology and Genomic Medicine
magdalena.gorska@cuanschutz.edu

Jenna Guthmiller, Assistant Professor - Department of Immunology and Microbiology
Jenna.guthmiller@cuanschutz.edu

Kathryn Haskins, Professor- Department of Immunology and Microbiology
katie.haskins@cuanchutz.edu

Peter Henson, Distinguished Professor- National Jewish Health – Department of Immunology and Genomic Medicine

peter.henson@cuanschutz.edu or hensonp@njhealth.org

Katherine Hisert, Assistant Professor- National Jewish Health – Department of Immunology and Genomic Medicine Hisertk@njhealth.org

V. Michael Holers, Professor - Department of Medicine, Division of Rheumatology
michael.holers@cuanschutz.edu

Elena Hsieh, Assistant Professor - Department of Pediatrics, Division of Allergy and Immunology
elena.hsieh@cuanschutz.edu

Christene Huang, Professor – Department of Surgery
Christene.huang@cuanschutz.edu

Hua Huang, Professor of Medicine- National Jewish Health – Department of Immunology and Genomic Medicine
hua.huang@cuanschutz.edu or huangh@njhealth.org

Ethan Hughes, Associate Professor, Department of Cell and Developmental Biology
Ethan.hughes@cuanschutz.edu

Jordan Jacobelli, Assistant Professor- Department of Immunology and Microbiology, Barbara Davis Center for Diabetes jordan.jacobelli@cuanschutz.edu

Edward N. Janoff, Professor - Department of Medicine, Division of Infectious Diseases
edward.janoff@cuanschutz.edu

William Janssen, Professor - National Jewish Health – Department of Medicine, Division of Pulmonary, Care and Sleep medicine
willam.janssen@cuanschutz.edu or Janssenw@njhealth.org

Sana Karam, Associate Professor- Department of Radiation Oncology
sana.karam@cuanschutz.edu
Ross Kedl, Professor, co-Director of Immunology Graduate Program - Department of Immunology and Microbiology
ross.kedl@cuanschutz.edu

Marijke Keestra-Gounder, Assistant Professor- Department of Immunology and Microbiology
marijke.keestra-gounder@cuanschutz.edu

Elizabeth Kovacs, Professor – Department of Surgery
Elizabeth.kovacs@cuanschutz.edu

Kristine A. Kuhn, Associate Professor of Medicine- Department of Medicine, Division of Rheumatology
kristine.kuhn@cuanschutz.edu

Laurel L. Lenz, Professor- Department of Immunology and Microbiology
laurel.lenz@cuanschutz.edu

Philippa "Pippa" Marrack, Distinguished Professor and chair- National Jewish Health – Department of Immunology and Genomic Medicine
philippa.marrack@cuanschutz.edu or marrackp@njhealth.org

Siddhartha Mitra, Assistant Professor – Department of Pediatrics, Division of Hematology, oncology and bone marrow transplantation
Siddhartha.mitra@cuanschutz.edu

Thomas E. "Tem" Morrison, Professor - Department of Immunology and Microbiology
thomas.morrison@cuanschutz.edu

Maki Nakayama, Associate Professor- Department of Pediatrics, Barbara Davis Center for Diabetes
Maki.Nakayama@cuanschutz.edu

Paul Norman, Professor- Department of Medicine, Division of Biomedical Informatics and Personalized Medicine
Paul.norman@cuanschutz.edu

Kyla Ost, Assistant Professor- Department of Immunology and Microbiology
Kyla.ost@cuanschutz.edu

Roberta Pelanda, Professor- Department of Immunology and Microbiology
roberta.pelanda@cuanschutz.edu

Cristina Penaranda, Assistant Professor- National Jewish Health – Department of Immunology and Genomic Medicine
Penarandac@NJhealth.org

Eric Pietras, Assistant Professor- Department of Medicine, Division of Hematology, Blood Cancer & BMT Program
eric.pietras@cuanschutz.edu

Janani Ravi, Assistant Professor – Department of Biomedical Informatics
Janani.ravi@cuanschutz.edu

Lee Reinhardt, Professor- National Jewish Health – Department of Immunology and Genomic Medicine
ReinhardtL@NJHealth.org

David Riches, Professor – Department of Pediatrics, Division of Cell Biology, National Jewish Health
richesd@njhealth.org

Mercedes Rincon, Professor- Department of Immunology and Microbiology
Mercedes.Rincon@cuanschutz.edu

Mario L. Santiago, Associate Professor - Department of Medicine, Division of Infectious Diseases
mario.santiago@cuanschutz.edu

James Scott-Browne, Assistant Professor- National Jewish Health – Department of Immunology and Genomic Medicine James.scottbrowne@cuanschutz.edu

David Schwartz, Distinguished Professor- Department of Medicine, Division of Pulmonary Sciences and Critical Care
David.schwartz@cuanschutz.edu

Jill Slansky, Professor- Department of Immunology and Microbiology
jill.slansky@cuanschutz.edu

Mia Smith, Assistant Professor- Department of Pediatrics
mia.smith@cuanschutz.edu

Daniel Sherbenou, Associate Professor – Department of Medicine, Division of Hematology
Daniel.sherbenou@cuanschutz.edu

Beth Tamburini, Associate Professor, co-Director of Immunology Graduate Program - Primary: Department of Medicine, Division of Gastroenterology and Hepatology, Secondary: Department of Immunology and Microbiology
beth.tamburini@cuanschutz.edu

Joshua Thurman, Professor of Medicine- Department of Medicine, Division of Renal Diseases and Hypertension
joshua.thurman@cuanschutz.edu

Raul Torres, Professor- Department of Immunology and Microbiology
raul.torres@cuanschutz.edu

Kenneth Tyler, Professor- Department of Neurology
ken.tyler@cuanschutz.edu

Linda F. van Dyk, Professor & Vice Chair- Department of Immunology and Microbiology
linda.vandyk@cuanschutz.edu

Andrés Vázquez-Torres, Professor- Department of Immunology and Microbiology
andres.vazquez-torres@cuanschutz.edu

Michael Verneris, Professor - Department of Pediatrics, Division of Hematology, Oncology and Bone Marrow
michael.verneris@cuanschutz.edu

David H. Wagner, Jr., Associate Professor - Department of Medicine, Division of Pulmonary Sciences and Critical Care
david.wagner@cuanschutz.edu

Cara Wilson, Professor - Department of Medicine, Division of Infectious Diseases
cara.wilson@cuanschutz.edu

Fan Zhang, Assistant Professor – Department of Medicine, Division of Rheumatology and Department of Biomedical Informatics Center for Health Artificial Intelligence
Fan.3.zhang@cuanschutz.edu

Gongyi Zhang, Professor- National Jewish Health-Department of Immunology and Genomic Medicine
zhangg@njhealth.org

Yuwen Zhu, Associate Professor- Department of Surgery, Surgical Oncology Division
yuwen.zhu@cuanschutz.edu

PROGRAM REQUIREMENTS AND CURRICULUM

Coursework and Registration

Registering for Classes

https://cuanschutz.edu/registrar/register/register-for-classes/register-for-classes

First year students. A rotation lab must be chosen before the start of that rotation and notify the program director and the program administrator. New students are strongly encouraged to discuss potential rotation labs with the their student advisory committee mentor (SAC).

Second year students. Prior to registering for Fall semester, the Preliminary Examination must be passed, a thesis laboratory chosen, and continuation approved by the Graduate Program co-Directors. Prior to registering for the Summer semester, a Thesis Advisory Committee meeting must be held, and the Comprehensive Exam passed.

Third year students and beyond. Students must be current with Thesis Advisory Committee meetings prior to registering each semester. (Thesis Committee meetings for students in the 3rd year and beyond must be held **every six months** unless another time frame is specified by their Committee Chair.)

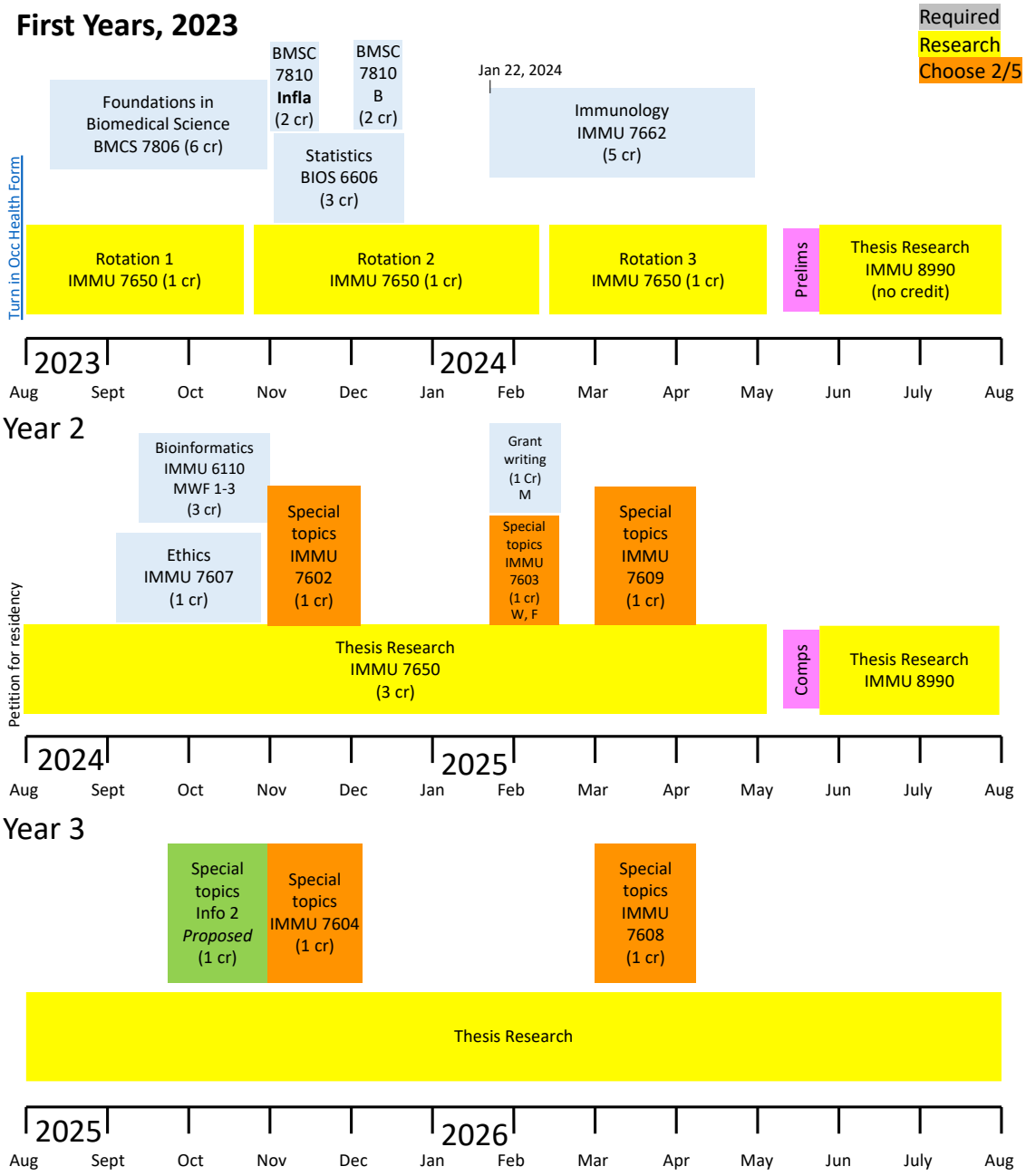
Courses

The Program Curriculum and Graduation requirements are 30 semester credit hours of coursework and 30 semester credit hours of thesis credits. All required course work should be completed before the end of the second year. Changes in the overall structure of the program may occur. This summary reflects the current requirements.

To register, please click on the link below using your university credentials and navigate to the registration page. https://portal.prod.cu.edu/UCDAccessFedAuthLogin.html The UCDAccess provides How To instructions inside the Portal.

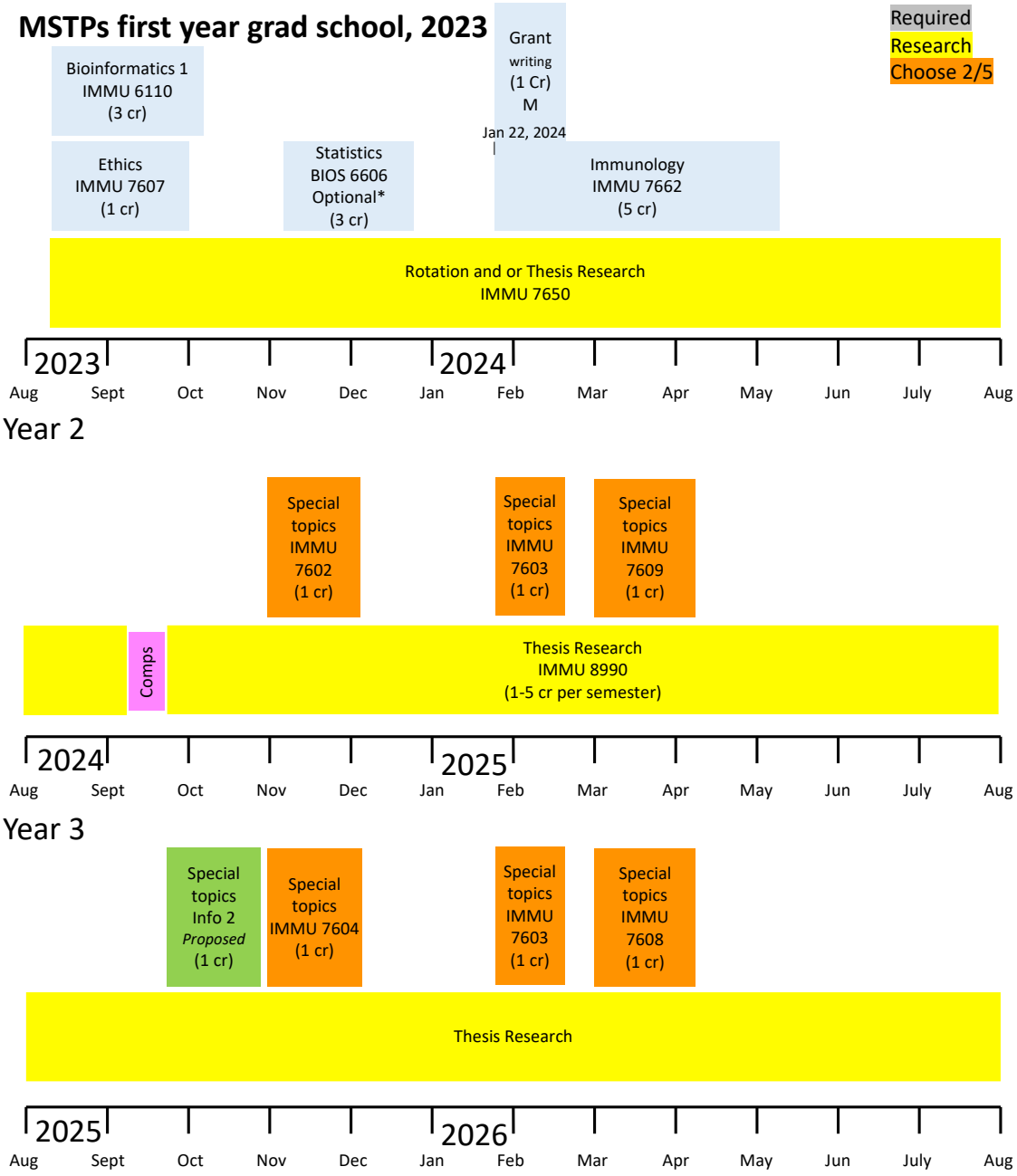
For questions, please contact: https://cuanschutz.edu/about/contact-us

Required Courses



Key to special topics classes:

7602 Tumor immunology
7603 Clinical immunology/The immunologic basis of human disease
7604 Signaling
7608 Autoimmunity
7609 Infection



Key to special topics classes

7602 Tumor immunology
7603 Clinical immunology/The immunologic basis of human disease
7604 Signaling
7608 Autoimmunity
7609 Infection

Elective Courses

The courses may change from year to year. Students completing the required courses will have accumulated the necessary 30 semester hours of course work and will not need to complete additional course work. However, electives are available but must be approved by the thesis advisor and should be approved by the written permission of the Graduate Program Steering Committee.

All students must be continually registered for 5 thesis credits upon completion of the Comprehensive exam except during the summer semester when students should register for 1 credit hour of IMMU 8990. Continuous registration is Fall and Spring semesters each academic year, beginning with the summer semester. Non-registration for two consecutive semesters is not allowed.

**Students transferring to Immunology from the Biomedical Sciences (BSP) or Medical Scientist Training (MSTP) programs may have different credit/course requirements. Applications for transfer will be evaluated based on thesis lab availability, transcripts, and performance on the preliminary exam and in rotation labs. It is important to understand that transfer from either program into the Immunology program depends on an Immunology faculty member agreeing to accept the student into her/his lab for their thesis work.

**Students may request to transfer credit of previous graduate work into the Program, upon satisfactory completion of at least one semester in Graduate School at the University of Colorado Anschutz Medical Campus as a regular degree student. Grades in the courses requested for transfer must be no lower than B. Please contact the Program Administrator for additional requirements/policies. The Graduate Program will not consider transfer of credit for the required Core Immunology sequence.

Laboratory Rotations

Students must complete three rotations in different Immunology faculty laboratories within the first year (Fall through Summer). Each rotation is typically 11-weeks long and 1 credit hour. Your work in this rotation is evaluated and graded. To arrange a rotation, each student should discuss potential projects first with the prospective advisor(s) and the student and advisor should come to a mutual decision. Direct Admit students will not rotate through labs and will spend their laboratory work time in their mentor's lab.

Students must inform the Program Administrator of the lab in which rotations will be conducted at the beginning of each rotation to ensure proper tracking and progress.

Because these rotations are the primary means for each student to become acquainted with the range of techniques, scientific interests, administrative styles, and personalities of each lab, the selection of a rotation lab each semester should be a systematic process. Another major goal of the rotation is to enable a student to select their thesis lab. Therefore, a student may only perform rotations with faculty who have regular appointments in the Graduate School. If a student wishes to rotate in a laboratory of a faculty member with a special appointment in the graduate school then a co-mentor with a regular appointment must be chosen. Rotations with faculty who are not members of the Immunology Graduate Program must be approved by the program director. ***Students must seek the advice of the Program Directors (Ross Kedl or Beth Tamburini) or First Year Student Advisory Committee (Beth Tamburini, Marijke Keestra-Gounder, or Andrew Getahun) when considering potential laboratory rotations.***

The other purpose of the rotation is so that faculty can assess and gauge the student's ability, engagement and enthusiasm for research. Thus, these rotations provide information to the faculty and enabling them to determine whether they would accept the student into their laboratory for thesis work. NOTE: IT IS THE STUDENT'S RESPONSIBILITY TO PERFORM WELL DURING THESE ROTATIONS SO THAT THEY CAN NOT ONLY IDENTIFY

LABORATORIES THAT THEY ARE INTERESTED IN, BUT ALSO IMPRESS FACULTY SUFFICIENTLY SO THAT THE FACULTY MEMBER IS WILLING TO SERVE AS THEIR MENTOR. ***ENTRANCE INTO A THESIS LAB IS NOT GUARANTEED. IT IS THE STUDENT'S RESPONSIBILITY TO FIND A THESIS LAB AND FACULTY ADVISOR.*** At the completion of each rotation, each student is expected to present a short talk in their respective lab meeting, summarizing the experimental problem addressed, the techniques used to approach it, and data obtained during the rotation. The rotation advisor must complete an online evaluation of the student's performance after the rotation and should discuss the evaluation with the student. The evaluation will be saved online as part of the student's academic record.

† For a current list of faculty with Graduate School appointments please visit: https://cuanschutz.edu/graduate-programs/immunology/faculty

Preliminary Exam

At the end of the first year of coursework, students take a preliminary exam to assess their mastery of immunology.

Preliminary Exam

The Immunology Program Curriculum Committee: Preliminary Exam Committee administers immunology preliminary exam. The content and format of the exam is subject to change year to year, but will focus on examining the student on the concepts and information learned during the first year.

The purpose of this exam is to test a broad understanding of immunology and immunological concepts derived primarily from the graduate immunology required coursework. It is important that prior to planning any time away at the end of the first year you are aware of the current year date for the Preliminary Exam.

IMMU Preliminary Exam Guidelines

All IMMU students will complete the Preliminary Exam at the end of their first year of coursework. Four weeks before the exam, students will be provided three research topics. Each research topic will include a prompt and a review article to guide the students. Students will choose one of the research topics to prepare their Preliminary Exam. The written component of the Preliminary Exam consists of a short mini-grant proposal. One week after submission of the written proposal, students will have an oral exam administered by three faculty members. The written proposal is due one week prior to the oral exam date – this is a firm deadline and extensions will not be provided.

Preliminary exam topics will be based on recent review articles in Current Opinion in Immunology (https://www.sciencedirect.com/journal/current-opinion-in-immunology). Three review articles will be chosen each year; one will focus on innate immunity and/or inflammation, one on B cells, and one on T cells. Each review article will be the basis for a research topic 'prompt', provided in the form of a question.

The proposal format is as follows: a minimum of 2 pages and a maximum of 3 pages, single-spaced, in Arial 11pt font, with 1" margins all around. The proposal also must include a bibliography for references cited and a model figure. The bibliography and model figure are NOT included in the 3-page limit. The mini-proposal should include the following sections:

1. Background (~2/3 page)
    a. Synthesis of key pre-existing literature
    b. Statement of unanswered question(s)
2. Rationale and Hypothesis (2-3 sentences)
    a. Rationale for proposed experiment(s)
    b. Hypothesis being tested
3. Experimental plan (1-1.5 pages)
    a. One Specific Aim
    b. Experiment(s) to test aim
    c. Predicted outcomes and Interpretations
    d. Alternative approaches
4. Bibliography of references cited and a model figure

The oral exam will be 1-hr in length. Students should prepare a 5-7 minute presentation, with no more than 6 slides, that covers key points of the proposal. After this introductory presentation, the remainder of the exam will take place without any audiovisual aids (i.e., no further slides allowed).

Students will be evaluated on both the written and oral components of the exam based on the preliminary exam rubric; see Appendix 1. The exam is designed to test each student's understanding of key concepts and ability to think through experimental design, both of which are important for research in biomedical sciences, with a focus on immunology. While the main focus of the questions will be related to the written proposal, students should expect questions outside the immediate scope of written proposal. All questions, however, will be limited to the

material that the student was exposed to during courses and rotations that they had within the first year of the graduate program.

1. After each exam, the exam committee will deliberate and come to a consensus score in each of the 4 areas described in the rubric. Those scores, along with any comments, will be provided to each student at the end of the exam day. If a student scores a 1 in any area of the rubric, that will trigger a need for remediation in that area. If a remediation is needed, it will be individually tailored to that area and each student's needs and should be completed before the beginning of the next academic semester.

Comprehensive Exams

General Information

Purpose

- The purpose of the Comprehensive exam is to test the student's knowledge and ability to critically think as they progress through the Immunology graduate program. This exam includes both a written proposal and an oral defense.
- The Comprehensive Exam ensures that there are no concerns that would preclude the student from formal admission to candidacy for a Ph.D. at the University of Colorado. After successful completion of the comprehensive exam, the student focuses on the laboratory component of their thesis research.
- The Comprehensive Exam process also creates an opportunity for students to be immersed in the grantwriting process, through writing an "NIH-style" proposal.

General Timeline and Components of the Comprehensive Exam:

The Comprehensive Exam (I.e. "Comps") occurs in the spring of the student's second year, as detailed below. This process involves two major steps. First, the student will prepare an NIH R21-style written proposal (typically written between February-April, submitted to the examining committee by early May). Second, the student will participate in an oral examination (typically mid-May), during which a committee of five faculty members ask a series of questions of the student, ranging from questions specific to the written proposal to underlying concepts in immunology. At the conclusion of the exam, students will either pass, pass with conditions, or fail (as detailed below).

Comprehensive Exam Committee

The exam committee for each student will be established by the Comprehensive Exam Chair of the Immunology Graduate Program. This committee will include the Comprehensive Exam Chair and four additional Immunology Graduate Program faculty that hold current appointments in the UC AMC Graduate School. Committees will be derived from a limited pool of faculty, such that any given exam committee will share at least three members with at least two other exam committees. In addition, at least one member of the student's thesis advisory committee will be a member of their examining committee with the intent that this faculty can relay the outcome, strengths and weaknesses of the student to the thesis advisory committee.

All examinations will be given in the same 2-week period in mid-May of the student's second year; students may be given the option for their exam to occur in an earlier 2-week block, at the discretion of the Comprehensive Exam Chair of the Immunology Graduate Program. MSTP students will take their Comprehensive exam in a 2-week block in September. The composition of the committees and the unified time frame for examination are implemented to enhance continuity and equity for the students throughout the examination process. The

thesis advisor cannot serve as a member of the exam committee although they are expected to attend the exam strictly as an observer.

Student Requirements Leading up to the Comprehensive Exam

The Comprehensive Exam is a formal exam and the student must be registered for the semester in which they take the exam. ***In addition to registering for the semester, the student must complete necessary paperwork through the Graduate School a MINIMUM of 2 WEEKS before the exam.*** There are two forms to be completed: "Application for Candidacy Form" and "Exam Request Form", both which can be found at https://graduateschool.cuanschutz.edu/forms-resources/resources

Timeline for the Comprehensive Exam Process

1. The Comprehensive exam written proposal: The subject of the comprehensive exam will be an NIH R21-style grant proposal (R21 format http://grants.nih.gov/grants/guide/pa-files/PA-10-069.html) written by the student. This proposal may or may not be the student's primary research focus in lab, a decision left to the student. Writing the Comprehensive exam proposal involves two stages, typically separated by the student's first thesis committee meeting:
    a. Stage 1: Crafting a Specific Aims page. Before the student's first thesis committee meeting, student and mentor may work together to craft the aims for the comprehensive exam. This process may occur from the Fall through January or February.
    b. First thesis committee meeting: The student typically completes their first thesis committee meeting in January or February; this meeting must take place before the end of March of their second year. A primary focus of this meeting is for the student to present their overall thesis aims (further detailed in the section "Thesis Advisory Committee Meeting Format" below). In addition, the student may use this opportunity to present and receive feedback on potential Aims for their comprehensive exam. This hybrid approach of presenting both thesis Aims, and potential comprehensive exam Aims, is at the discretion of the student and mentor.
    c. Stage 2: Moving past the Specific Aims page, to write the proposal. After a student completes their first thesis committee meeting, the student will pivot to writing their Comprehensive exam proposal. Students typically work on their proposal between February-April. For this second phase, the student is expected to develop and write their proposal without the assistance of their mentor or others. Feedback on writing should only be obtained by the student working with their Comps Exam Chair. After the first thesis meeting, it is acknowledged that the communication boundaries between student and mentor with regard to thesis and comprehensive exam aims may be "blurry". That said, the student should try and largely restrict comps-related communication to the Comprehensive Exam Chair.

2. Assignment of Comprehensive exam committee members:
    a. Students will be assigned a comprehensive exam committee chair by January of the student's second year. The student's comprehensive exam chair is the primary point of contact for the student for all questions and requests for feedback on the written proposal. The student should meet as soon as possible

with the Comprehensive Exam Chair, with scheduled monthly check-in meetings. Communication with the Chair, and especially submission of documents for review by the Chair, should be done in a timely fashion so that the chair has adequate time to provide feedback.

b. Students will be assigned the remaining members of their exam committee by March of the student's second year.

3. Submission of Comprehensive exam written proposal:
    a. Completed written proposals must be submitted 2 weeks before the first scheduled exam date in a block of exams. Typically, this will be by the 1st of May; for MSTP students this will usually be by the 1st of September.
    b. Students must email the finished written proposal to the Comprehensive Exam Committee Chair and the Graduate Program Administrator before end of day (11:59 PM) of the submission deadline. Failure to submit the proposal in a timely fashion may result in a fail.

4. Mock oral exams: Once a student submits their written proposal, the student should participate in mock oral exams, led by Immunology students who have previously passed their Comps exam. Students can individually organize their own mock exam or work in coordination with the IGSB to schedule their mock exam.

5. Oral examination: The formal defense of the proposal will occur before the end of May in a student's second year. For MSTP students that transitioned into the program the previous May, oral exams will occur in September.

Proposals

Comprehensive Exam Topic

The comprehensive oral examination will typically be centered on the student's thesis research, but may or may not be the student's primary research project in the lab, a decision left to the student. It is anticipated that in some cases, a student's comprehensive exam may serve as a basis for applying for external funding. One of the potential complications of this format, where thesis project and comprehensive exam topic are inter-related, is that a student's thesis work is a complex compilation of the student's, mentor's, and even thesis committee's ideas and hypotheses. These factors complicate the evaluation of the originality of the proposal and to what degree the proposed research plan is the result of the student's ideas or those of their advisor/committee. The steering committee has acknowledged this as a hazard of the chosen format and, while no strict policing of this will be performed, all students are encouraged to work as independently as possible on both the formulation and the writing of the Comprehensive Exam proposal.

Preparation of the Proposal

1. The student is responsible for writing the proposal. The student can, and should, receive feedback on their document from their assigned Comprehensive Exam chair during this process (I.e. Stage 2, as described above). The chairperson will offer suggestions about the structure of the proposal, the material covered in the Background and Significance, the feasibility and design of experiments, etc. The chair may also offer input as to the grammar and sentence construction should they feel so inclined.

2. The general format is prescribed for an NIH R21 application. Students may read proposals from previous students however they should be aware that they must follow the format prescribed by the program for the current year.

3. Students may get advice on techniques from others, but besides the chairperson no one should read the proposal without the recommendation and approval of the chairperson.

4. Any issues that arise should be discussed and resolved with the chairperson.

Use of generative artificial intelligence (AI) in writing the Comprehensive Exam proposal.

1. Learning how to write an effective grant is critical for a developing scientist. The rapid rise of generative AI tools (e.g. chatGPT) has provided new opportunities and challenges for the writing process. Use of generative AI tools to facilitate writing of the Comprehensive Exam proposal is at the discretion of the student, and will not be considered positively or negatively by the examining committee. This policy only applies to Comprehensive Exam written proposal and is NOT intended to apply to other aspects of the Immunology program.
2. If a student chooses to use generative AI tools (including but not limited to chatGPT, GPT4, Claud and others) to facilitate writing of their Comprehensive Exam written proposal, the student should: i) declare its use to their assigned, Comprehensive Exam Chair, ii) carefully review and edit any proposed text to ensure scientific accuracy, including appropriate references and iii) acknowledge use of generative AI when they submit their completed proposal to their Examination committee. Acknowledgment of the use of generative AI should be stated as follows (based on, and modified from, Author guidelines developed by the publisher Elsevier, https://www.cell.com/cell/authors).

During the preparation of this proposal, I used [NAME TOOL / SERVICE OF GENERATIVE AI (e.g. chatGPT)] in order to [REASON]. After using this tool/service, I reviewed and edited the content as needed and take full responsibility for the content of this proposal.

Format and Structure

1. The format and page guidelines for the written proposal may change from year to year. As of 2023, the the written proposal should be a MAXIMUM 7 page document (single spaced, 11 pt, Arial font, 0.5 inch margins), containing: **I)** a 1-page Specific Aims page, and **II)** a 6-page "Research Strategy" that includes sections on Significance, Innovation, and Approach.In addition, proposals should also include: III) a Graphical Abstract (no more than ½ page in size) and IV) a reference list. Graphical Abstract and References are NOT included in the 7-page limit.

2. Appearance and legibility are very important. Incorporation of figures is also very useful.

3. Proposals typically contain some preliminary data, but students are NOT evaluated on their progress in lab work in the Comprehensive Exam (something which is the responsibility of the thesis committee).
4. The 1-page **Specific Aims** page should include a testable hypothesis, based on experimental evidence. The specific aims are the approaches that you will adopt to address the general hypothesis. An Aim is not necessarily a single experiment but is often a series of experiments designed to accomplish one goal. Similar to R21

applications, comprehensive exam proposals typically present experiments in 2 specific aims that can be accomplished in 2 years.

5. The 6-page "**Research Strategy**" should include the following 3 sections: 1. Significance, 2. Innovation, 3. Approach, including subsections on experimental design, anticipated results and alternative approaches. More detailed information about the expected content of each of these sections can be found in the "PHS 398" instructions for grant applications to the National Institutes of Health. A pdf of these instructions can be found at the NIH website ().

6. In the **Significance** section you should answer the question of why this research is important. This is a very important component of the proposal as you are trying to convince the reader that they would want to know the answer to your experiments (for example they would actually want to read the paper(s) when this work is published). The PHS 398 instructions include:
    - Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
    - Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
    - Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

7. The **Innovation** section should describe why specifically your proposed experiments are important for the question being addressed. The PHS 398 instructions include:
    - Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
    - Describe any novel theoretical concepts, approaches or methodologies, instrumentation or intervention(s) to be developed or used, and any advantage over existing methodologies, instrumentation or intervention(s).
    - Explain any refinements, improvements, or new applications of theoretical.
    - Note that the Innovation section is NOT simply a restatement of significance, but instead emphasizes conceptual, methodological or technical innovations within the proposal.

8. **Approach**. It is recommended that you write out the experiments you propose for each specific aim one-by-one, and for each aim, include a section that covers the following:

    Rationale. Why is this a logical experiment to do? Why is the approach that you have selected the best way of approaching the experiment? This may also include a discussion of your interpretations of conflicting data in the literature or could include very specific data not given in the background section.

    Experimental Design - define exactly what experiments you would do. You may include methods here or list them after. The experimental details should be very clear: for example, how many mice will you inject and at what age? Male and female? If not, why? What will you inject? When will you sacrifice the mice and analyze them? What will you assay for? Describing methods with which most investigators in the field would be expected to be familiar with is not necessary or desirable, but the specifics should be addressed. For instance, if you're doing a

Southern blot, what is your probe? What restriction enzymes will you use? How will you interpret your results? Or, if you're doing flow cytometry, what antibodies will you use? How will they be labeled?, etc. If appropriate you should define what statistical analysis you would perform on the data?

It is extremely important that the proposed experiments be realistic and feasible. Many experimental ideas are great in theory, but once the experimental details are described potential limitations become evident.

Interpretations and Limitations. What will the data look like if your hypothesis is correct? How would interpret alternate outcomes? How would you interpret partial phenotypes (e.g. results that are 50% of wildtype levels). What things might be expected to go wrong? Have you made any assumptions that could turn out to be pitfalls? What will you do if this happens? Can any of this be avoided? Note - in the past, some students have designed specific aims that were mutually dependent, e.g. Aim 2 could not be undertaken if Aim 1 did not turn out as expected. This should not be! Mutually dependent experiments within an aim are okay, but you must point out that this is the case, and discuss alternatives if the outcome is not what you expect it to be.https://www.cell.com/cell/authors

Oral Examination

1. The Comprehensive Exam Committee Chair of the Immunology Graduate Program will schedule the date, time and room (in coordination with the program administrator) for the oral exam, and inform the student. It is the student's responsibility to complete the paperwork with the graduate school, and to arrange any audio-visual equipment (ie. Laptop). If there are questions about the paperwork, the program administrator should be contacted.

2. 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. Although the mentor is not required to be present, the program strongly encourages the mentor to attend so that they may gain insight into the "strengths and weaknesses" of their student. Only the exam committee, the student and the mentor(s) are allowed to attend any part of this exam. Any exception to this must be approved by ALL members of the committee.

3. The format of the oral exam is the following:
    - Initial Committee Discussion: Once the meeting is convened with student, mentor and all examining committee members, the student and the mentor (if present) are asked to leave the room. The chairperson will then lead a brief discussion (<5 minutes) to remind committee members of the scope of the exam, to ensure balanced representation of questions across basic immunology and proposal-specific topics across the committee, and discuss issues with the written document. If the committee considers it appropriate, the mentor may be invited back into the room without the student for further discussion and/or consultation.
    - Student Presentation: Next, the student and mentor are invited back into the room and the student will give a brief oral presentation on their proposal. THIS SHOULD BE A MAXIMUM OF 12 MINUTES. Suggestions for this presentation could include: 1-2 slides of background, 1 slide of significance followed by (perhaps) 4 slides for each experimental Aim that outlines the rationale for the Aim, experimental approach, possible data obtained (e.g., in a Table with + or - for expected results) and limitations of the approach.
    - Examining Committee questions: Upon completion of the student's presentation, each member of the committee will then ask the student questions about the presented material. The questions should primarily focus on the proposal (rationale, significance, experimental design and interpretation of data), however the student should also be prepared to answer questions relating to background material (e.g. if a proposal is focused on the immune response to a certain peptide, the student may be asked to discuss how different peptides are processed and presented, to test the student's foundational knowledge of this process). Generally, each examiner will be allowed ~15-20 minutes of questions (timed by the exam chair), with the entire exam typically lasting 2–2.5 hours.
    - Examining Committee discussion and decision:
        - After each member of the committee has asked any questions that they may have, the student and the mentor are asked to leave the room and to remain outside the exam room while the committee discusses the student's performance. If the committee considers it useful they may ask the mentor to return to offer additional insight about the student.

    - The examining committee can make one of three decisions about the exam: Pass, Fail or Pass with conditions). Generally, the Pass vs. Fail decision is based on the student's oral exam, with Fail only coming into consideration if the student is woefully unable to defend their document or demonstrates significant deficits in their knowledge. Pass with conditions is typically invoked if there is a substantive issue with the written document that the committee agrees requires a rewrite. These are solely guidelines and may be adjusted based on individual circumstances.
  - Advising the Student & Mentor about the Committee's decision: After the committee reaches its decision about the outcome of the exam (Pass, Fail or Pass with conditions) the student and mentor are invited back into the room and advised of this decision. The examination form is signed by the committee and returned to the Graduate School Office.
  - The committee is encouraged to provide written feedback to the student regarding the written proposal, the presentation and their performance in answering questions. This can be done by email communications coordinated by the chairperson. If this is done, a copy should be sent to the program administrator for inclusion into the student's file.

4. What happens if a student passes with conditions? If a student passes the examination with conditions, those conditions must be stated on the examination form and satisfied within two months (60 days). The committee chair or another member of the committee will also prepare and share with the committee, student, and student's thesis advisor a written statement that details the committee's expectations for these conditions. The statement will specify the concerns that need addressed and the format by which these will be addressed. The committee/statement may require the student to (a) make edits or revisions to the existing written exam that are within the parameters (e.g. page limits) of the original exam, (b) write a new document that addresses conditions but is separate from the original document, or (c) request that the student complete other conditions as specified. If the student is asked to prepare a new document, the committee's written statement will indicate the expected length of the new document. The committee chair is responsible for monitoring the conditions and reporting their outcome to the Graduate School. Failure to satisfy these conditions will result in failure of the examination.
5. What happens if a student fails the Comprehensive Exam? A failed examination is discussed by the Immunology Program Directors and the Comprehensive Exam Committee and is based on the oral defense of the student's proposal and a written summary of the exam by the chair. Thus, the outcome of this meeting will be determined on a case-by-case basis. A student who fails the examination is subject to immediate dismissal from the Graduate School upon the recommendation of the program and concurrence of the Dean. However, at the discretion of the Immunology Program Directors and the recommendation of the comprehensive exam committee, a student who fails the examination may retake it once. The retake will be in the form designated by the Immunology Program Directors and the Curriculum Committee and must be completed within three months. The original examination form noting the failure is signed by the committee and returned to the Graduate School office. New examination forms will be generated when the examination is rescheduled. Students will be required to meet registration requirements and be registered during the term in which the repeated exam is taken.

Application to Candidacy

Completing the required courses for the program does not automatically admit a student to candidacy for the degree. Each student must complete the *Application for Admission to Candidacy* form (available to download from the Graduate School website under Student Resources – see link below). This application for candidacy must be completed, reviewed and signed by the Program Directors (Ross Kedl OR Beth Tamburini) and approved by the Graduate School**.** This application requires a clear listing of the courses completed and that fulfill the requirement for 30 graded credit hours (see below).

Once the Graduate School approves candidacy, the student will be sent notification by mail at the address the student lists on the *Application.* To apply for candidacy, students must have completed, or be currently registered to complete, 30 semester hours of course work. For Immunology Program students, this means that an application to candidacy can only be submitted *after* registering for the Spring semester Special Topics courses (IMMU 7603, 7604). Again, **a student should have completed (or have registered for) all required courses prior to admission to candidacy.**

The Application to Candidacy form can be found here:
https://graduateschool.cuanschutz.edu/forms-resources/resources

Thesis

Students must register for **thesis** credits in the semester following successful completion of the Comprehensive Exam. The student must continue to register for IMMU 8990 (from 1-5 credits) in Fall and Spring semesters each year. For the Summer term, register for 1 credit hour unless you are defending in the Summer semester and then should register for 5 credits regardless of the number of qualifying thesis credits you have accumulated. In addition, failure to comply with the registration requirement could result in having to retake the comprehensive exam.

Advisors

Students should select a thesis advisor by the end of the Spring semester of the first year. Thesis advisors are selected by mutual consent of the student and the faculty member. A student's placement in a thesis lab must be approved by the Program Director.

Committees

After successful completion of the Preliminary examination, the student should choose a thesis advisory committee, in consultation with his/her advisor.

1. The thesis advisory committee is composed minimally of a committee chair and four other faculty members, all holding current appointments as faculty in the Graduate School. Furthermore, the majority of this committee (i.e., at least 3) must be comprised of the Immunology Program faculty. If the committee has 6 members, then 4 must be Immunology Program faculty.

2. All Committee members must have Graduate Faculty status. If a faculty member does not have Graduate Faculty status, please ask him/her to contact the Program Director

for approval. It takes several months for the Graduate School to approve a faculty member for Graduate Faculty status. Should a member not be approved at the time of the defense, the defense could be voided.

3. The student's thesis advisor may not be a voting member of the thesis committee.

4. A list of Immunology Graduate Program training faculty and their primary academic appointments is available for reference on the Graduate School website: https://www.cuanschutz.edu/graduate-programs/immunology/faculty

5. The primary duties of the thesis advisory committee will be to guide and advise the student's research progress. As the thesis committee needs to provide unbiased advice to the student, the committee membership should be independent from the mentor. Any individual with a real conflict-of-interest (e.g. financial interest or a spouse of the mentor or student) cannot be a voting member of the committee. Conflicted individuals may still participate in committee meetings but must leave the room with the mentor or student, as appropriate. In addition, a majority of members should not have direct involvement in the student's project or be a close collaborator of the mentor.

6. The student must provide the Program Administrator with the names of his/her Thesis Committee members and have their first committee meeting at least one month prior to their scheduled Comprehensive exam in May (see above). **The minimum time between your first committee meeting and your defense is two years.**

Thesis Advisory Committee Format

Evaluation of Student Progress

Student's progress in the program will be determined by evaluation of:

1. Research productivity
2. Development of ability to independently conceptualize, design, carry out, analyze and present his/her experiments
3. Ability to discuss his/her research area and answer questions about the research and its context
4. Knowledge of the relevant literature
5. The quality of Research – in –Progress (RIP) presentation
6. Progress towards creating his/her (first-author) publication(s)
7. Progress towards a complete body of work that will constitute his/her thesis

If the student's progress is considered unsatisfactory, the committee should issue a warning to the student in which the deficiencies are clearly identified and a time period should be set within which it is expected that the student will correct the deficiencies. A copy of the warning is filed in the student's official program file by the program administrator. At the end of the warning period, the committee and student will meet to assess progress. If on re-evaluation, progress is found to remain unsatisfactory, the committee will draft a recommendation to be reviewed by the Program Directors. The Immunology Program Directors will inform the student and committee members of the decision in writing.

Thesis Advisory Committee Meeting Format

The thesis committee meeting is meant to provide the student, advisor and the Immunology graduate program with an evaluation of student progress and to provide support and

recommendations to the student and advisor on the thesis project. This should be carried out in a scientifically critical and rigorous but collaborative manner. Meetings are not intended to be examinations. Ideally, meetings should be a scientific discourse between the student and the thesis advisory committee. The thesis advisor is not expected to participate unless invited or to clarify or to redirect discussion.

During the thesis committee meeting the student is expected to provide experimental findings obtained since the last committee meeting as well as future direction of the project with experiments expected to be accomplished by the next committee meeting. Depending on the student's need and direction the data presented may be preliminary or from other sources (i.e., not from the student, per se). This venue is also meant to provide students with an opportunity to hone their scientific communication skills in describing their experiments and interpreting their findings to other scientists.

1. The first committee meeting should be completed prior to the end of March of the second year.
2. Prior to the ***first committee meeting*** the student should provide each committee member with a Specific Aims page that provides a specific hypothesis and question that is being addressed with specific aims. *P*rior to ***subsequent committee meetings*** the student should provide the thesis committee chair and committee members with a student thesis committee report, which can be obtained from the program administrator. The form includes the following:
    a. Overall thesis research goals and hypotheses that incorporate any changes to those goals resulting from previous committee meetings.
    b. Previous concerns/recommendations of previous thesis committee meeting.
    c. Accomplishments since last meeting discussing how you have addressed previous recommendations and, if you did not, then why not (i.e., not enough time, took different direction, etc.). Include any new methods/techniques you may have learned, any literature sources or collaborators that were significant.
    d. How did your results affected your original hypothesis or goals? (confirm, deny, modify).
    e. Based on the data/results described in (c), state briefly your next steps in elucidating the hypotheses.

3. Each committee meeting should begin with a short discussion with the student in the absence of the mentor, and with the mentor in the absence of the student. In these discussions both advisor and student are encouraged to provide a candid assessment of the mentorship and how the dissertation project is progressing and whether any issues have surfaced that the committee needs to be aware of.

4. The thesis committee meeting should begin with a slide prepared by the student that discusses career goals and a list of activities accomplished in the previous year that relate to these goals. This also serves as an official Individual Development Plan (IDP) discussion for the student and advisor.

5. The student should then present his/her recent research findings to the committee, discuss how these findings impact the thesis work and the future experiments to be performed before the next committee meeting
    a. It is important the student understands that they should ultimately control these meetings (increasingly so after each meeting). This is best accomplished by having, and presenting, a clear understanding of where he/she is in their thesis project, where the committee (and specific committee members) can be of

particular help (direction, technique, approach, etc.) and what are the next goals.

b. The student should be aware that any data or experiments that are presented can very easily generate discussion by the committee members that ultimately can take up considerable time. Thus, the presentation of background information and experiments that are not going to be pursued or are not relevant to the thesis direction should be carefully considered.
c. The thesis committee chair is responsible for ensuring that the discussions stay pertinent to the thesis topic and that respect is maintained towards both student and faculty.

6. Each committee meeting should end with a discussion amongst committee members (in the absence of student and advisor) on the student's project and progress. The goal of this discussion is to reach a consensus sentiment by the committee on these topics that should be included in the Thesis Committee Report.

7. The Committee chair should then relay the consensus sentiment to both student and thesis advisor immediately following the meeting.

8. *Finally, the student (and faculty committee members) should be cognizant of the dual nature of the responsibilities of faculty committee members: to nurture and promote scientific progress and development during regular committee meetings and, ultimately, the same faculty members are required to rigorously examine the student on their thesis topic and general immunology concepts during the thesis defense.*

Responsibilities of Thesis Committee Chair, Committee Members, Advisor, and Student.

Thesis Advisory Committee Chair responsibilities

The Thesis Committee Chair has responsibilities above and beyond that of committee members. Thus, ***before agreeing to accept the chair, faculty should ensure they have adequate time to give to the student and their thesis project.*** Thesis Committee Chair must be a core-training faculty from the Immunology Graduate Program with a Regular appointment in the UC Graduate School faculty.

Responsibilities include:

1. Presides over the meeting of the Thesis Committee, student and advisor. This includes ensuring the discussion stays on topic and that there is mutual professional respect between adult students and faculty.
2. Completes the online Thesis Committee Report **(**http://predocprogress.ucdenver.edu/) after each committee meeting, summarizing the discussion and the recommendations of the committee. This report must indicate if progress is satisfactory or unsatisfactory and should be determined after the meeting and as agreed upon by committee members in the absence of the student and advisor. The online report should then be submitted "in collaboration mode" for input from the other committee members, followed by formal submission when this is achieved.
3. Attends the student's RIP and completes the online evaluation of the presentation (http://predocprogress.ucdenver.edu/).
4. Be accessible to the student to discuss issues arising related to the thesis project.
5. Meets at least every 6 months individually with student (in the absence of advisor) to assess lab environment, mentoring, progress (excluding data and actual experiments).
6. Serves as a liaison between the student and thesis advisor and thesis committee should

matters of disagreement surface.
7. Serves as a liaison with program leadership should the need arise.
8. Presides over the Thesis Defense.

Thesis Advisory Committee Member responsibilities

A student's thesis committee serves several important functions in the student's thesis work and is deserving of appropriate effort and energy by each member. Thus, it is recommended that faculty limit thesis committee membership to 12 committees. Thesis committee members must hold Regular or Special Faculty appointments in the Graduate School. By assuming committee membership, you must agree to:

1. Attend an approximate 2-hour thesis committee meeting every six months throughout the student's thesis work.
2. Provide the student with guidance concerning the research and help redirect the research into productive avenues.
3. Evaluate the student's progress and ensure that the project is of interest, novel, focused and feasible. The outcome of this work must lead not only to his/her thesis but also to a peer-reviewed first-author publication. Members of the committee must keep this in mind. Work towards this is expected to commence when the student enters the thesis lab meeting.
4. Attend the student's mandated Research-in-Progress (RIP) presentations and relay evaluation to the Thesis Committee Chair.
5. Promote the student's development into a rigorous independent investigator.
6. Provide the student and the mentor with an opportunity to express privately any concerns about the research environment or the progress of the research (see below).
7. Attend student's thesis defense as a faculty examiner.

Online **Thesis committee report** form and **RIP evaluation** form to be completed by thesis committee chair: http://predocprogress.ucdenver.edu

Thesis Advisor responsibilities

Agreeing to supervise and direct a graduate student and their thesis project carries considerable responsibility that comes with obligations to the student, Immunology graduate program and Graduate School. Thesis advisors must hold a Regular faculty appointment in the Graduate School. Where co-thesis-advisors are chosen by the student, one may hold instead a Special faculty appointment.

The thesis advisor responsibilities include:

1. Provide guidance in the selection of an appropriate thesis research project that addresses an important biological (immunological) question. Furthermore, you are responsible for directing the student in this research by nurturing independent and critical research and with the clear goal of publishing *at least one* first author manuscript(s) that advances the field.
2. Mentor is expected to work with their student and thesis committee to guide the student to completing a first-author research publication prior to graduation.
3. You agree to meet with your student regularly to discuss experimental results, interpretation and direction.
4. Attend the student's Comprehensive exam (usually held during May of the student's first year in the lab, September for MSTP students joining the Immunology Program). The

thesis advisor's attendance is not mandatory but is strongly encouraged to identify the strengths and weaknesses of the student.
5. Together with the student, compose the student's thesis advisory thesis committee and identify an appropriate thesis chair.
6. Ensure the student schedules a thesis committee meeting at least every 6 months as required by the Immunology Graduate Program rules and attend each of these meetings.
7. Attend each of your student's Research-In-Progress presentations.
8. Strongly encouraging your student to attend all graduate program seminars, RIPs and journal clubs.
9. Encourage and financially support your student's attendance at the annual Immunology and Microbiology Conference.
10. Read and approve the student's thesis prior to distributing to the committee members.
11. Provide financial support for the student's stipend and research throughout their thesis work. Students should not be supported by a funding mechanism (e.g. corporate funds) that in any way restricts publication of the student's research findings.
12. Coach and encourage your student through the writing and publication process.

Graduate Student responsibilities

1. Student is responsible for arranging and scheduling the meeting with the thesis advisory committee ***every 6 months*** unless both advisor and thesis committee chair have agreed otherwise. This includes arranging a meeting place, contacting committee members.
2. Student is responsible for informing the Program Administrator of the date and time of the scheduled meeting.
3. Prior to the first committee meeting a Specific Aims page should be provided to all committee members. For all subsequent committee meetings, the student should submit a formal write-up of the previous committee meeting to all committee members and as outlined below*; it is the chair's responsibility to read this prior to the meeting.
4. After each committee meeting, the student should provide the thesis committee chair with a copy of his/her presentation.
5. Student is expected to notify the thesis committee members sufficiently in advance of scheduled RIP presentations so that they can schedule attendance.
6. Student is expected to work with their mentor and thesis committee to develop and complete a first-author research publication prior to graduation.
7. Student is responsible for meeting with their thesis chair every 6 months (in the absence of advisor) to discuss lab environment, mentoring, progress, etc. Discussion of data and experiments, while fine, is not the goal of this meeting.
8. **Students must be current with thesis committee meetings and reports to register for classes. Any financial consequence of not registering (including tuition payment) will be the student's responsibility.** (Any exceptions to this, or any other program policy, require approval by the Graduate Program Directors).

Student thesis committee write-up to be completed prior to committee meetings

1. State your overall thesis research goals and hypotheses. Incorporate any changes to those goals resulting from previous committee meetings.
2. What were previous concerns/recommendations of previous thesis committee meeting?
3. What have you accomplished since then? Discuss how you have addressed previous recommendations, if you did not then why not (ie, not time, took different direction, etc). Include any new methods/techniques you may have learned, any literature sources or collaborators that were significant.

4. How did your results affected your original hypothesis or goals? (confirm, deny, modify).
5. Based on the data/results described in (3), state briefly your next steps in elucidating the hypotheses.

Publication Requirement

Publications are the final step of research done in the lab. Public funds support the research endeavor and all scientific research builds on the work and results of others. For these reasons, all scientists are obligated to share their findings with their peers and the public.
Students in the Immunology program are expected to, at a minimum, have published one first author research publication upon graduation. A co-first authorship may be considered to satisfy this requirement in specific, approved, situations. To meet this goal, a qualifying paper (as judged by the thesis committee) must be **accepted** for publication prior to the student setting a thesis defense. To ensure this requirement can be met, each student, thesis committee member, and mentor are expected to begin working towards achieving this minimum requirement as soon as the student enters the thesis lab.

Exceptions to this requirement can be made on a case-by-case basis. This will be approved only in rare cases where there are extenuating circumstances. Approval of any exceptions shall be recommended by the thesis committee chair for approval by the Program Directors. If one of the Program Directors is in conflict (e.g. due to membership on the thesis committee or as the mentor), the other Program Director will evaluate and approve or decline the exception. If both Program Directors are in conflict, the Program Steering committee will evaluate and approve or decline the exception.

Writing and Defending

The Graduate School requires a specific format to be followed when writing the dissertation and that is provided in a style and policy manual for writing theses and dissertations. In addition, the Graduate School conducts semi-annual seminars on thesis preparation; you are strongly encouraged to attend one of these sessions.

Your thesis must be approved by your (thesis advisor and) Committee Chair *before* you schedule a defense date. The manuscript must be publication-quality, i.e., in final form except for printing on quality paper; words must be spelled correctly, figures and tables must be labeled correctly, the manuscript must be readable, Graduate School format must be followed, the Table of Contents must be completed, Bibliography included and appropriately annotated, etc. Examples of what is unacceptable include cut and pasted graphs, more than 10 typos, and incomplete references. Please see the IMMU 2023 thesis format guidelines in the appendix.

As in the Comprehensive Exam Guidelines, the student is responsible for coordinating and scheduling the defense, including preparation and posting of seminar notices. The program administrator may help with these tasks, but must be requested.

Arrangements for the thesis defense must be made in the Graduate School Office at least two weeks prior to the scheduled defense. The defense must be given no later than three weeks prior to the date on which the degree is to be conferred. You must be registered for 5 credits of IMMU 8990 at the time of the defense.

Graduation

30 semester hours of graded course work including 8 credit hours of rotations.
30 semester hours of thesis credits.

A "pass" grade for the preliminary and comprehensive examinations.
Completed and approved thesis.

Graduate Student Activities

Journal Club

Journal club is a weekly seminar on current literature presented by students. Three times per year a faculty member hosts a “Pillars in Immunology” journal club that centers on a classic immunology paper. First year students will be asked to sign up to present an article sometime following the first semester. The Immunology Graduate Student Board (IGSB) seminar coordinator will contact students about presenting. Journal clubs are an important aspect of graduate training and all students (entering through senior) are strongly encouraged and expected to attend each week.

Seminars

Numerous scientific seminars are conducted throughout the year. All students are expected to attend the Department of Immunology & Microbiology seminars, held at the CU Anschutz Medical Campus on Fridays from 12:00-1:00 pm in the Hensel Phelps East auditorium. A schedule is available on the Department website.

In addition, there are several regular weekly forums that are available for students to attend including other departmental and graduate program seminars at AMC and NJH as well as a weekly Lung Cell Biology Research Forum and Pulmonary Research in Progress that students are welcome to attend.

Research-in-Progress

A major component of our Immunology training program is the weekly Research-in-Progress (RIP) presentations in which graduate students and postdoctoral fellows give a 30-minute presentation of their current work. Currently this RIP forum is held every Wednesday (September-June)
with two individuals speaking for 30 minutes. These RIP presentations are presented for half the year at the Anschutz and half the year at NJH. The Immunology Program considers this an extremely important venue for our students and thus all program students 2nd year and beyond are expected to attend.

General Information

Checking Account

It is important to establish a checking account as soon as possible. The University issues all pay checks, including student stipends, as automatic direct deposits. Students should log into their portal and navigate to the resources tab to locate their W4 and Direct Deposit forms. Note: Direct deposit is mandatory and students have until August 16th to complete these two forms.

Office of Information Technology (OIT) and Software access

Students have access to a variety of free and reduced cost software through the OIT (https://www.cuanschutz.edu/offices/office-of-information-technology/tools-services). For first year students, costs associated with software access can be covered by the Graduate Program in Immunology and arranged through the Program Administrator. For students' second year and beyond, arrangements will be made through the students' home department.

CU Alerts!

CU Alerts! Emergency messaging includes email, text, computer pop-up messages, and social media postings. Please visit the Emergency Management *CU Alerts!* Page www.ucdenver.edu/alerts and follow the instructions to register your cell phone number. Be sure to enter your cell phone number in the Employee Profile section of the portal as a "CELLULAR" device (or it will not be imported into the *CU Alerts!* System).

E-mail Access and IT Services

Graduate students will have an account in the electronic mail/internet access system. Note that these are university accounts and cannot be used for political lobbying, downloading music files, etc. University IT Services is also available to assist you with your IT/Helpdesk needs. Please refer to the following website for more information regarding their services and protocol- http://www.ucdenver.edu/about/departments/ITS/Pages/OIT%20Home.aspx

Most communications from the Graduate Program in Immunology will be via e-mail and all Immunology Graduate Program students are expected to have e-mail access, to monitor this account regularly, and to respond to emails from the Program Administrator, Program Director, and other Program Faculty.

Finances

All incoming Graduate Students are offered a financial aid package from the Graduate School that includes an *annual stipend* of $34,000 (approved for Academic Year 2022-2023), *tuition costs*, and payment of *individual student health insurance* and *activity fees*. Please note that this support covers the period July 1, through June 30, and is dependent upon satisfactory academic progress as defined in the Graduate School and Program policies.

Students are funded from a variety of sources of funds awarded to each institution: NIH Training Grants, NIH Research Funds, and industrial fellowships, to name just a few. Each source (Federal or Non-Federal, Institutional or Individual) has its own set of guidelines when awarding funds to an institution and, each institution has administrative policies to which it must adhere for the dissemination of those funds. The source of funds and the awarded institution dictate the policies for payment. It is advised that students become familiar with the sources of their support and the guidelines that apply. The Program will make every effort to ensure that students are supported throughout their program. However, students are encouraged to apply for the many alternative sources of individual funding.

Health Insurance

Student health insurance is part of the financial package offered to incoming Graduate Students. The health insurance invoice is paid in conjunction with your tuition invoice. All degree and specific approved, certificate-seeking students enrolled in five or more credit hours must take the School of Medicine's Student Health Insurance Plan. Students covered by another source of insurance through a spouse/partner may request a waiver and must do so by 9/13/19. Students wishing to cover dependents may enroll them at their own expense.

The University of Colorado provides varied student needs in the area of health. The Student Health Insurance (SHI) Plan is designed to provide students with health care coverage offering a PPO accident and sickness health plan.

The Student Insurance Office is available to all students at the School of Medicine to assist with selecting or waiving the Student Insurance Plan. If you are having problems understanding a bill, or you think an error has been made, don't hesitate to contact the Student Insurance Office. One of the functions of the Student Insurance Office is to help you resolve billing issues.

All students are required to have an initial health screening. It is best to sign up for this as soon as possible at the Student Health Services. Further information will be provided at the Graduate School Orientation or speak with Jill Collins (303-724-7674.)

Location:

Office of Health Promotion | University of Colorado Anschutz Medical Campus
Mail Stop A035, Education II, North Room #3208
Aurora, CO 80045
https://cuanschutz.edu/student/health-wellness
Phone: 303-724-7674 Email: Health.promotion@cuanschutz.edu

Hours: 8 am – 5 pm (Appointments recommended)

ID/Access Badge: Identification Card and After Hours Access

Everyone on campus must carry a UCD picture ID at all times. This ID serves many purposes including enabling students to access the library, parking, gain access to the laboratory sections of the Department, after-hours entry into RC-1, after-hours access to the elevators, and to attend special University functions. Please notify your Department Administrator immediately if your UCD ID is lost so it can be canceled and replaced.

Keys

Your thesis advisor will guide you to the proper Department Administrator to issue keys for office doors, alcoves and interior rooms. Entrance to animal and BSL-3 facilities requires modification of your ID card. There is a substantial charge for lost keys.

Lab Training Classes

There are several university requirements to assure safety of all personnel who work in laboratories. The Environmental Health and Safety Division of UCD offers classes and certification in **radioisotopes, handling hazardous waste, and blood borne pathogens**. For working in microbiology laboratories, all of these classes are recommended. Each topic has an initial class with extensive handouts to read before and an annual refresher class in which you will hear about new regulations, recent problems, etc. The information on the scheduling of the classes is on the website: http://www.ucdenver.edu/research/EHS/Pages/EHS.aspx

The Animal Care and Use Program provides information about requirements for using animals in research programs. Special training in surgery, anesthesia, etc. is offered from time to time:

http://www.ucdenver.edu/research/OLAR/Pages/default.aspx

Graduate students should take these classes at the beginning of their first rotation. Radioisotopes may be taken at a later date or a non-users version may be taken depending on the laboratories in which rotations will take place. Please notify the Graduate Program Administrator as soon as the necessary examinations have been passed so the information can be put into your folder. It is the student's responsibility to stay current with required annual refresher classes.

Students must complete the following Skillsoft classes prior to working in the lab:

- Lab Safety
- Blood Borne Pathogens
- Regulated Medical Waste Management
- Chemical Waster Management

All new research associates, animal care workers or faculty, staff, fellows, students and affiliates who are part of an IACUC or IBC protocol that works with animals, animal waste, or animal tissues or enter the vivarium as well as those who work with the items detailed below are required to enroll in the Occupational Health Program (OHP).

- toxins/venoms
- infectious agents
- anesthetic gases
- anti-neoplastic drugs
- teratogens/carcinogens
- radioactive materials
- heavy metals
- lasers
- formaldehyde
- human blood, tissues, cells or cell lines

Enrollment consists of completing and submitting the Initial Medical Surveillance Questionnaire, then scheduling an Initial Medical Surveillance appointment by calling the Occupational Health Clinic at (303) 724-9145. All prior written immunization records need to be submitted prior to the appointment or brought to the appointment. Your health information, immunization history and work-related duties will be reviewed by the OHP nurse to identify any potential hazards and review health recommendations and follow-up.

Depending on your risk category, the OHP may require you to undergo additional training, medical surveillance, or additional vaccinations and/or titers prior to initiating your duties. Upon completion of the Initial Medical Surveillance appointment, a certificate of OHP enrollment will be issued and your OHP enrollment status forwarded to either the IACUC or IBC.

All employees will need to submit an Annual Medial Surveillance Form each year to keep their enrollment current. The OHP will send out an annual reminder to each individual prior to the due date. If the Annual Medical Surveillance Form is not received by the OHP by the end of the anniversary month, steps can be taken to ensure compliance including notification of Principal Investigator (PI) or Supervisor and leading up to OHP disenrollment and/or vivarium badge access removal.

Library

The Health Sciences Library purchases many online journal subscriptions that can be easily accessed on campus via https://library.cuanschutz.edu/.

National Jewish Tucker Medical Library

The NJH library is located on the first floor of the Goodman building on the NJH campus.

Interlibrary loans are available for may journals/articles not subscribed to by the Library. Graduate students may petition the Graduate Program Director (Laurel Lenz) if they believe there is limited access to books or other library materials relevant to their studies.

Parking & Transportation

Many parking options are available to students at the Anschutz Medical Campus and your first stop will be the Parking Office in Building 500 if you are interested in any parking on campus. You can learn more about student parking on the parking office's website, but for convenience, we've summarized some key options here as well.

You will be provided an RTD Eco pass each year. Your RTD Eco Pass is not just for commuting to and from campus. You have unlimited rides on regular fixed route service provided by RTD and all RTD contractor-operated fixed route service, including bus and Light Rail.

2019/2020 Student Parking Permit Rates

- Students: $40/month
- Permit parking after hours and weekends only: **No Charge. Monday -Friday 6:00pm to 6:00am or all day on Saturday and Sunday** – Access in or out of the lot will be denied outside of this time frame. Those still in the lot after 6:00am will be required to pay the hourly parking rate upon exit.
- **Rock Lot Parking: $14/month**, The Rock Lot is a low-cost parking option for students on the Anschutz Medical Campus that is in close proximity to the campus. It is located on the west side of Victor Street north of the UPI garage.
- Reserved Parking: $95/month
- Carpool: $42/month
- Short Term Weekly Parking (1 to 8 weeks): $16/week
- Manage Your Student Parking Permit Online (Please note: You must have established parking at the Parking Office before you will be able to manage your parking account online.)

Research Core Facilities

- Advanced Light Microscopy Core
- Animal Model Core
- Biostatistics & Bioinformatics Core
- Biophysics Core
- DNA Sequencing & DNA Analysis Core
- Electron Microscopy Core
- Flow Cytometry Core
- Genomics & Microarray Core
- High-Throughput Sequencing Core (HTSC)
- Histopathology Core
- Mass Spectrometry Core
- Nuclear Magnetic Resonance (NMR) Core
- Peptide & Protein Chemistry Core

Residency Status

By the end of your first year of training, students from out-of-state must petition the Office of the Registrar for in-state resident status for the purpose of tuition classification. This is a ***very important*** priority for first year students. After the first full year, funding will be available (assuming satisfactory academic progress) only if the student qualifies as an in-state resident or is a foreign national. Required objective evidence of residency includes:

- Colorado Driver's license

- Colorado automobile registration & license plates
- Colorado voter registration
- Colorado state income tax records
- Ownership or Rental of residential property for at least 12 months

It is important to note that students are initially classified as “resident” or “non-resident” for tuition purposes during the Admissions process. The classification is based upon information furnished by the student and from other relevant sources. After the student's status is determined, it remains unchanged in the absence of satisfactory evidence to the contrary. Once the student has met the requirements for establishing residency (“domicile”) as defined by Colorado law, the student may submit a Petition for In-State Tuition/Residency Classification to the Office of the Registrar. (Please see section, “Petitions and Appeals”).

The requirements for establishing residency for tuition purposes are defined by Colorado law. (See **Colorado Revised Statutes 23-7-101 et. seq**. View online at http://www.michie.com/colorado. As tuition classification is governed by state law and by judicial decisions that apply to all public institutions of higher education in Colorado, the University of Colorado does not have discretion to make exceptions to the rules as established by state law.

The statutes require that a qualified individual must be domiciled in Colorado twelve (12) consecutive months immediately preceding the term for which resident status is claimed.

An individual is “qualified” to begin the process of establishing domicile and the one year domicile period by virtue of adulthood and emancipation at age 22, marriage, or enrollment in a post-baccalaureate graduate or professional degree program. An unemancipated minor is qualified through the residency of his or her parents or legal guardians. (See below “Emancipation and Residency.”)

Additional information can be found here: http://www.ucdenver.edu/anschutz/studentresources/Registrar/StudentServices/Residency/Pages/Residency.aspx

Stipend Support, Health Insurance, and Tuition

Students in the Graduate Program in Microbiology receive an annual stipend ($37,000 for 2023-2024 academic year), individual health and dental insurance, and tuition. The Program Administrator will arrange for payment of these funds and handle any financial problems that may arise. Late registration fees are the responsibility of the student.

First-year non-resident students are expected to take all necessary steps to attain **Colorado Residency** by the end of their first year in the Program. This makes them eligible for in-state tuition rates, a very considerable savings. The Program is only responsible for the cost of the equivalent of the in-state tuition rate after the student’s first year.

After the thesis mentor has been selected, the student's stipend, insurance, tuition, research expenses and professional travel will be paid from grants to the mentor. While receiving support from an NIH grant, you cannot receive additional funds from outside employers per NIH guidelines.

Teaching Opportunities

Students who have an interest in teaching experience should make this interest known to the Director of the Graduate Program and to their advisory committee (Pre-Comps or Thesis). It is possible to gain teaching experience by participating in the teaching labs for medical students or by facilitating paper discussions for first year core students. The faculty will provide advice in

preparation and feedback on teaching performance in order to improve teaching skills. Other teaching opportunities may be available within UC Denver. For students interested in other teaching opportunities, it is the responsibility of the student to obtain approval of their advisor, to conform to relevant UC Denver Graduate School policies, and to inform both the Microbiology Graduate Program Director and their Thesis Committee.

Travel to Professional Meetings

Professional scientific meetings are excellent places to learn what is new in a particular field, interact with scientists from other institutions and countries, see new equipment, and present research data. A student's attendance at local, national, or international meetings is by mutual agreement between the student and mentor based on scientific or financial criteria. Reimbursement for meeting travel costs and expenses are provided from the mentor's research funding (at the mentor's discretion and only with prior approval of the mentor) or the student's individual graduate fellowship.

Students may also apply for a Hirs award for travel to national meetings from the Graduate School. Student travel awards are provided from an endowment entitled the "C. Werner and Kitty Hirs Graduate Student Enrichment Fund" made to the University of Colorado Foundation for the use by the Graduate School at the AMC of UC Denver. Awards will be for up to $500 and are to be used to help defray the expenses incurred by a Ph.D. student who attends a national society's meeting and presents his/her work.

Eligibility:

1. The student must have successfully passed his/her comprehensive exam.
2. The student must be enrolled in a basic biomedical sciences Ph.D. program.
3. The student must have an abstract (first author) submitted and accepted for presentation at the meeting.
4. The student's laboratory mentor must commit to providing any additional support necessary for the student to attend the meeting.

Many national meetings also offer partial funding for selected graduate students to attend. It is the student's responsibility to investigate and apply for such external funding. Funding for attending a meeting is often coupled to having research data to present at the meeting as a poster or oral presentation with slides. Abstracts for meetings are due months in advance of the meeting. Information on various meetings and their abstract deadlines is available at the websites of various scientific societies.

All travel funded by University funds must be pre-authorized by obtaining departmental approval. The Administrative Assistant or your thesis advisor **in your home department** will assist you in making all your travel plans (airfare, hotel, etc.). It is your responsibility to contact them as soon as you begin making plans for your travel and well before the meeting begins. Advance planning will avoid paying late registration fees and higher airfares.

Tuition

Tuition is paid by the Graduate School for first year students and by the student's thesis advisor in subsequent years. Tuition payment is subject to the following limitations:

- Payment for tuition, benefits and fees is processed by your Program Administrator
- **Tuition will be paid only at in-state tuition rates after the first year. Any additional tuition will be the responsibility of the student. Thus, it is imperative that out-of-state students establish in-state residency within the first year as to avoid paying**

the difference in out-of-state versus in-state tuition (See In-state Residency Status section). This is not the case for foreign students who do not qualify for in-state residency. For such students, the thesis advisor will be responsible for tuition payments.

- Please make every effort to register before the Add/Drop published deadline. (The student is responsible for any late fees incurred.)
- Neither the Department nor the Program will pay tuition for retroactive registration

APPENDIX 1

Graduate School
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

Academic Calendar – Fall 2023

This calendar:

- applies to MS and PhD programs affiliated with the Graduate School on the **Anschutz Medical Campus**.
- only includes deadlines pertaining to coursework or those managed through UCDAccess.

For deadlines pertaining to graduation, please see the Graduation Deadlines document on the Graduate School website.
For policies, procedures and deadlines related to the tuition waiver benefit, please visit the Employee Services website.

Month	Day	Deadline	Notes
June 2023	5	First day to submit a **new** non-degree application or **continuing** non-degree course permission form.	Taking a class requires active non-degree student status. Continuing non-degree students must submit a signed course permission form to enroll every semester.
	12	First day to apply for Fall graduation in UCDAccess.	If you intend to graduate in Fall, you must complete this online application. If you do not, you will not be eligible to receive your degree until Spring.
July 2023	3	Course enrollment for Fall begins in UCDAccess	
August 2023	4	Last day to petition for resident (in-state) student/tuition status.	Funded PhD students who do not establish residency by second year may have to pay the tuition difference.
	7	Last day to submit a **new** non-degree application or a **continuing** non-degree course permission form.	See June 5 for more info.
	28	First day of Fall full semester classes.	
September 2023	4	Labor Day Holiday	No classes. Campus closed.
	8	Last day to add/drop courses in UCDAccess. * Courses dropped after this date will appear on your transcript with a grade of "W." * Students will be charged all tuition and fees for any course dropped after this date. * Students will be charged a $60 late fee to add courses after this date.	After this date: • use the small Add/Drop Form to modify credits or add classes if already enrolled in at least one (1) credit. • students who have not registered in any classes must use the Registrar's Registration Form and get the Assistant Dean's signature. • use the Registrar's Course Withdrawal form to withdraw from (drop) a class.
		Last day to apply for graduation in UCDAccess.	If you intend to graduate in Fall, you must complete this online application. If you do not, you will not be eligible to receive your degree until Spring.
November 2023	23-24	Thanksgiving Holiday	No classes. Campus closed
December 2023	11-15	Final Examination Week	
	15	End of semester	Fall 2023 degrees will be awarded effective this date.
	20	Final grades due (noon)	

Spring 2024	January 22	Classes begin	
	January 15	Martin Luther King Day	No classes. Campus closed.
	February 19	President's Day	No classes. Campus closed.
	March 18-22	Spring Break	No classes. Campus open.
	May 17	End of semester	
	May 20	Commencement & Convocation	
Summer 2024	June 3	Classes begin	
	July 4	Independence Day Holiday	No classes. Campus closed.

APPENDIX 2

Vacation/Leave Policy

GRADUATE SCHOOL POLICY FOR VACATION AND LEAVE FOR PH.D. STUDENTS

Graduate school is a privilege; working in the biomedical research/academic field, whether as a graduate student, a postdoctoral fellow, or an independent investigator, is a challenging profession requiring a high level of commitment and responsibility. Students who receive full-support stipends from Ph.D. programs at the University of Colorado Anschutz Medical Campus must pursue their training full-time, devoting each day of the typical work week plus any additional time required by their research projects and academic courses. Within those demands and expectations, it is also important to take time away. Consequently, the Graduate School has established the following guidelines for the amount of vacation and leave time allowable for students to maintain full-time student status.

LEAVE TYPES AND AMOUNTS

Vacation and Holidays. Graduate students shall receive all CU Anschutz campus holidays and no more than 10 week days (not including weekends) of vacation per annum, with no year-to-year accrual. Students shall continue to receive stipends during vacations and holidays. The times between academic terms and the summers are all considered active parts of the training period and leave must be taken in accordance with this policy. Students supported via extramurally funded projects or training grants must comply with sponsor requirements regarding effort.

Sick Leave. Graduate students may continue to receive stipends for up to 11 week days (not including weekends and campus holidays) of sick leave per annum, with no year-to-year accrual. Under exceptional circumstances, additional sick days may be granted following a written request from the student and approval by the student's thesis advisor (if known) and program director. Sick leave may be used for medical conditions related to pregnancy and childbirth. Students supported via extramurally funded projects or training grants must comply with sponsor requirements regarding effort.

Parental Leave. Graduate students may receive stipends for up to 8 work weeks (not including weekends and campus holidays) of parental leave per annum for the adoption or the birth of a child. Either or both parents are eligible for parental leave. Student's must provide advance notification to their thesis advisor (if known) and/or program prior to taking parental leave. Sick leave may not supplement parental leave except as noted above. Students supported via extramurally funded projects or training grants must comply with sponsor requirements regarding effort.

Unpaid Leave. Individuals requiring more than 11 week days (not including weekends and campus holidays) of sick leave or more than 8 work weeks (not including weekends and campus holidays) of parental leave must seek approval from their thesis advisor (if known) and their program for an unpaid leave of absence. A leave of absence must be

requested by the student and approved by their thesis advisor (if known) and program in advance of taking the leave of absence. The leave period and conditions must be documented at the times of leave and of re-entry into the program. A copy of this agreement must be submitted to the Graduate School. Students supported via extramurally funded projects or training grants must comply with sponsor requirements regarding effort.

Unused Leave at Termination. Upon graduation or termination, a graduate student forfeits all unused vacation, sick, and parental leave; payment may not be made from grant funds (training grants or research grants) for leave not taken.

LEAVE REQUESTS AND REPORTING

Students are required to report leave requests (vacation, sick, and parental leave) to 1) their thesis advisor, 2) the program in which they reside, and/or 2) their thesis advisor's home department or unit. If both the program and home department/unit provide reporting mechanisms, students will defer to the requirements of the advisor's home department/unit. It is the student's responsibility to identify the correct process for reporting leave.

Students who have not yet joined a thesis lab (e.g., first-year students) are advised to discuss with potential dissertation advisors any additional expectations regarding vacation and leave. After a student has selected their thesis advisor and joined the advisor's research program, they must request and receive approval for vacation leave from their thesis advisor in advance of taking vacation leave. The student must make all necessary arrangements in advance to cover any responsibilities that the student has for the research program or for maintaining their ongoing experiments and/or resources (e.g., cell lines, animals). If students are unable to reach an agreement on vacation leave with their advisor, they can discuss challenges of this nature with program leadership. In all cases, students supported via extramurally funded projects or training grants must comply with sponsor requirements regarding effort.

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

APPENDIX 3

Resources for New Graduate Students

Animal Facility/Safety Training
http://www.ucdenver.edu/academics/research/AboutUs/animal/Pages/Training.aspx

Bookstore (303-724-2665)
Located in Education 2 South, first floor. Special bookstore charge accounts are attainable; students should request information at the front registers. The bookstore accepts VISA, MasterCard, American Express, and personal checks with appropriate identification. Bookstore hours are extended during the first week of each quarter.
https://cuanschutz.bncollege.com/webapp/wcs/stores/servlet/BNCBHomePage?storeId=87741&catalogId=10001&langId=-1

Bursar's Office (303-724-8032)
The Bursar is responsible for all financial activities related to student billing, tuition collection, institutionally managed loan programs and coordination with the state.
Located in Education 2 North, room 3120A
http://www.ucdenver.edu/student-services/resources/CostsAndFinancing/billing/Pages/StudentBilling.aspx

Campus Health Center at CU Anschutz (303-724-6242)
12348 East Montview Boulevard, Aurora, CO 80045
Services:

- Behavioral and Counseling Services
- Flu Shots
- Physical and General Services

http://www.ucdenver.edu/academics/colleges/nursing/clinical-practice-community/PatientServices/CHC/Pages/default.aspx

Campus Shuttle
http://www.ucdenver.edu/about/departments/FacilitiesManagement/ParkingMaps/Pages/ShuttleService.aspx

CARE Team (303-352-3579)
The Campus Assessment, Response & Evaluation (CARE) Team was created to address the health and safety needs of students as well as the campus community. The purpose of the team is to assess whether individuals pose a risk to themselves or others and to intervene when necessary, and more generally, to identify and provide assistance to those in need. The team takes a preventative approach to risk assessment by offering resources, referrals, and support to both the concerning individual and those impacted by their behavior.
http://www.ucdenver.edu/life/services/care/Pages/default.aspx

CeDAR (720-848-3000)
Center for Dependency, Addiction and Rehabilitation is the University of Colorado Hospital's premier addiction treatment center. Check the events schedule for on-campus recovery meetings.
https://www.cedarcolorado.org/

Disability Resources and Services (303-315-3510)
The University of Colorado Denver is an educational institution that 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.
http://www.ucdenver.edu/student-services/resources/disability-resources-services/Pages/disability-resources-services.aspx

Diversity and Inclusion, Office of (303-724-8003)
The Office of Diversity and Inclusion (ODI) provides leadership to enhance diversity university-wide and to foster a culture of inclusion
http://www.ucdenver.edu/about/departments/odi/Pages/default.aspx

Ethics Hotline (1-800-677-5590)
CU EthicsLine provides a way to anonymously report concerns involving fiscal misconduct, violations of state or federal law, serious or recurring violations of university policy, or gross waste of university funds or property. The reporting service is provided by EthicsPoint, an independent company that provides similar services for hundreds of companies and universities. Options for 24/7 reporting are via a toll-free phone number (1.800.677.5590) or online (www.Ethicspoint.com).

Environmental Health & Safety, Department of (303-724-0345)
N-95 Respirator Training/Fit-Testing (for those needing to go into the BSL-3)
Radiation Safety Training
http://www.ucdenver.edu/research/EHS/Pages/EHS.aspx

Equity, Office of (303-315-2567)
Staff can assist with reports of discrimination, harassment, or sexual misconduct. They can also take ADA accommodation requests, and/or reports of accessibility issues.
http://equity.ucdenver.edu/

Financial Aid (303-724-8039)
http://www.ucdenver.edu/student-services/resources/CostsAndFinancing/Pages/CostsFinancing.aspx

Family Educational Rights and Privacy Act (FERPA) guidelines
http://www2.ed.gov/policy/gen/guid/fpco/faq.html

Graduate School (303-724-2915)
http://www.ucdenver.edu/academics/colleges/Graduate-School/Pages/default.aspx

ID/Access Badging Office (303-724-0399)
http://www.ucdenver.edu/anschutz/about/location/Police/ElectronicSecurity/SecurityBadgingOffice/Pages/SecurityBadgingOffice.aspx
Information Technology, Office of, OIT (303-724-4357)
https://www1.ucdenver.edu/offices/office-of-information-technology

IT equipment, server, local software in Department of Immunology & Microbiology only
Please submit all support requests using a ticket at:

http://Micro-LS1.ucdenver.pvt/support/

LGBTQ Student Resource Center (303-556-6333)
LGBTQ Student Resource Center is a tri-institutional office on the Auraria Campus serving the students, faculty and staff of Metropolitan State College of Denver, Community College of Denver and University of Colorado at Denver and Health Sciences Center. We are available to students as a resource for exploring issues of sexual orientation and gender identity.
http://www.ucdenver.edu/life/services/glbtss/services/Pages/default.aspx

Ombuds Office (303-724-2950)
The Ombuds Office is a **safe**, confidential, and **nonbiased** resource that members of the University of Colorado-Denver can approach to discuss, voice, and clarify any university-related concerns. We are a neutral third-party resource that is available to hear individual complaints and help sort out and **identify options** for resolving those concerns.

The Ombuds Office is well-trained in listening, facilitating, recommending, mediating, and coaching. Each individual on our team is a member of the International Ombudsman Association and are **Certified Organizational Ombudsman Practitioners**.

We even offer trainings and seminars for groups and departments to help learn communication skills, conflict management, and effective team building.
http://www.ucdenver.edu/about/departments/OmbudsOffice/Pages/OmbudsOffice.aspx

Parking & Transportation (303-724-0049)
https://www.cuanschutz.edu/offices/facilities-management

Police, Anschutz Medical Campus (303-724-4444) Emergencies 911
Registrar, Office of (303-315-2600)
https://www.cuanschutz.edu/registrar
Registering for classes, downloading course books and ordering transcripts

Advanced Light Microscopy Core
Animal Model Core
Biostatistics & Bioinformatics Core
Biophysics Core
DNA Sequencing & DNA Analysis Core
Electron Microscopy Core
Flow Cytometry Core
Genomics & Microarray Core
High-Throughput Sequencing Core (HTSC)
Histopathology Core
Mass Spectrometry Core
Nuclear Magnetic Resonance (NMR) Core
Peptide & Protein Chemistry Core

Student Health, Office of (303-724-7674)
The Student Health Insurance (SHI) Plan at the Anschutz Medical Campus is designed to provide students with health care coverage, offering a PPO accident and sickness health plan. Located in Education 2 North P28-3207

Student Services
- American Indian Student Services
- Asian American Student Services
- Black Student Services

- Counseling Services
- Office of Campus Student Services
- Student Conduct and Community Standards, Office of
- Veteran Student Services
- Writing Center

https://www.cuanschutz.edu/student/services

Student Mental Health (303-724-4953) Afterhours emergencies (720-848-0000)
We provide comprehensive and confidential mental health services for all students enrolled in the schools located at the Anschutz Medical Campus (Medical, Dental, Nursing, Pharmacy, Public Health, Physician Assistant, Physical Therapy, graduate school, etc.). Initial appointments are scheduled relatively quickly, often within the same week. Options for ongoing care include receiving treatment from the AMC Student Mental Health clinicians, the UCH Outpatient Psychiatry Clinic, and a community network of providers, depending on insurance coverage.
https://medschool.cuanschutz.edu/psychiatry/programs/student-resident-mental-health?_ga=2.10547252.1299306743.1597681249-1518195557.1532634900

Student Portal
Where you'll update/access your contact information, grades, financial information, employment information- pay, W2's, W-4's, employee ID #, various payroll forms (direct deposit), etc.
login is email username & password
https://portal.prod.cu.edu/UCDAccessFedAuthLogin.html

Student Senate (303-315-8254)
Located in Office Annex Building 1C35
http://www.ucdenver.edu/anschutz/studentresources/student-assistance/organizations/senate/Pages/StudentSenate.aspx
City/County/State

Arapahoe County Clerk and Recorder
CO car registration
http://www.co.arapahoe.co.us/Departments/CR/index.asp

Aurora, City of
https://www.auroragov.org/
Colorado Department of Transportation
Road conditions, travel warnings, etc.
http://www.cotrip.org/home.htm

Colorado Secretary of State
http://www.sos.state.co.us/

Denver County & City
http://www.denvergov.org/

Denver Convention & Visitor Bureau
http://www.denver.org/

Department of Revenue – DMV
Emissions testing is required for registering vehicle in Denver/Arapahoe counties
https://www.colorado.gov/dmv

RTD
www.rtd-denver.com

Voter registration
https://www.sos.state.co.us/voter-classic/pages/pub/olvr/verifyNewVoter.xhtml

Appendix 4

University of Colorado
Anschutz Medical Campus

Format Guidelines
for
Theses and Dissertations

Requirements and Guidelines for Students Submitting Theses and Dissertations to the Graduate School in Partial Fulfilment of Graduate Degrees

Effective February 2023

QUICK START GUIDE

If you are reading this, you are probably getting close to completing your thesis. Congratulations! Your thesis will be a digitally published scholarly work in ProQuest and you should be proud of both its content and format. This Quick Start Guide details simple choices you can make to meet the Graduate School requirements. Please also review the more detailed recommendations and examples that follow if your formatting needs/preferences aren't met by these abbreviated recommendations. For convenience, we will use "thesis" to broadly refer to all scholarly works produced by masters & doctoral students. The language in CU Anschutz dissertations and theses is English.

Formatting Your Thesis

1. Open a new document and set the following:
   - Margins: 1" all around
   - Font: any easily legible and widely used font (e.g. Arial or Helvetica 11,Calibri 12, Times New Roman 12) If using TeX or LaTeX typesetting, avoid Type 3 fonts.
   - Spacing: Double (but no more)
   - Alignment: Left
   - Paragraph indent: 0.5"
2. Prepare preamble pages in the following order, following the examples in Chapter II:
   Title Page, Approval Page, Abstract, Table of Contents (Optional: List of Figures, List of Tables, Abbreviations, Dedication, Acknowledgements are recommended in all cases, but detailed Acknowledgements are required if others made substantial contributions to the work contained in your thesis or dissertation)
   - It is acceptable (and easier) to only include chapter titles in the ToC even though the example has several header levels shown. Preamble pages can be included in your ToC, but are optional.
   - Otherwise, follow the templates exactly (content, alignment, spacing, bold, capitalization).
3. Create a page for each of your expected chapters.
   - Each chapter starts at the top of a new page.
   - Chapter titles should be centered, all caps, double-spaced and bold:

CHAPTER X

THE TITLE OF YOUR CHAPTER

4. Create a placeholder page for **REFERENCES**.
   - Title format: bold, centered, all caps
   - Entry format: no indent, single-spaced within entries, double-spaced between entries
   Consistent format of references throughout.
5. Insert page numbers in the bottom right corner of the footer.
   - Title page is page "i" but suppress it so the first page number is "ii" on the Approval (second) page.
   - Preamble pages are numbered with lowercase Roman numerals (ii, iii, etc.); the body text is numbered with Arabic numbers (1, 2, 3) starting with CHAPTER I as Page 1.
6. Establish your header styles (only regular double space before and after):

Level 1: Bold, Centered, Title Case, Double Spaced

Level 2: Bold, left-aligned, sentence case, double-spaced

Level 3: Italic, left-aligned, sentence case, double-spaced

7. Insert your figures and tables gathered at the end of each chapter.
   - Put each table and figure on its own page.
   - If you have landscape tables or figures, see Page 21 for instructions.
   - If you have large tables or figures (take more than one page including the caption), see Page 21 for instructions.
   - Table titles go above the table; figure captions go below the table.
8. Use reference management software such as EndNote, Zotero, Mendeley, CiteUlike, Papers, etc.
9. If necessary, format the appendix title(s) like chapter titles, except use capital letters (A, B, etc.)

Thesis/Dissertation Organization

Organize your thesis as follows. The **items marked with an asterisk (*) are required in every thesis and dissertation;** other items are optional. ("Thesis" is used below for both, for simplicity.) Examples of these items can be found below. Items 1-10 are collectively known as the "preamble" pages of your thesis.

1. Title Page*
2. Copyright Page (if needed)
3. Approval Page*
4. Abstract*
5. Dedication
6. Acknowledgements
7. Table of Contents* (ToC)
8. List of Tables
9. List of Figures
10. List of Abbreviations ↑ Number these pages with lowercase Roman numerals (e.g. i, ii, iv)

.....

11. Introduction (Chapters)* ↓ Number these pages with Arabic numbers (e.g. 1, 2, 10)
12. Materials and Methods
13. Research chapters
14. Discussion
15. Endnotes
16. Bibliography, Selected Bibliography or References* (note that in some submissions these occur in each chapter)
17. Appendix or Appendices

Common Mistakes

Common Mistake	How to avoid it!
Title page is numbered "i."	Suppress the page number on the first page or start numbering on the second page with "ii."
Errors in preamble pages.	Copy the sample pages exactly, including spacing and required text. Do not add embellishments like degrees or titles to faculty except as in the sample.
Program name is wrong in preamble pages.	Use your proper degree name, not your department or colloquial program names. Don't include tracks.

Your name varies in the preamble pages (e.g. middle included in some but not all places)	Your name should be the same in all three places it appears in the preamble pages
Approval statement isn't aligned correctly.	Align the approval statement to the right.
Advisor's title is wrong on the abstract page.	Ask or look up your advisor's title. It should be Assistant Professor, Associate Professor or Professor, with limited modifications (e.g. Research or Clinical). Do not include other titles (e.g. Department Chair)
Chapters formatted incorrectly in Table of Contents: Chapter I – Chapter Title…….1	Format correctly like this: I. Chapter Title……1
Extra space between paragraphs.	Remove extra space from Word's default "Normal" style before you start.
On landscape tables/figures, page number is in the correct place for landscape page orientation, but not portrait.	Insert your table/figure on a portrait-oriented page and rotate the table/figure rather than the page.
Headers aren't applied consistently throughout the thesis.	Choose a simple header format structure Use Styles in Word.
Chapters are numbered with Arabic numerals.	Use Roman numerals.
Short pages (too much white space).	Use the "gathered at the end" method for tables & figures; if using interleaved, make sure text flows to the bottom of the page before and resumes at the top of the page after the table/figure, even if the text breaks mid-sentence. Don't use page breaks to start new sections on a fresh page unless they would create an orphan header.
Orphan headers.	Each header should be followed by at least two lines of text, else insert a page break to start at the top of the next page.
Thesis submitted to the wrong campus in ProQuest.	Choose your program's home campus; if you don't see your program, you are on the wrong campus.

TEMPMLATE PREAMBLE PAGES

The following pages are templates of the required and optional preamble pages that must come at the beginning of your thesis. Remember that the title page is page "i" but it is not numbered as such, so page numbering begins on the second page with "ii."

We've used sample titles, names and other text in the sample pages so that you can see what the pages should actually look like. Blue descriptive text has been inserted in what should otherwise be blank double spaces. Do not include any of the blue text in your actual thesis and be sure to maintain double spacing throughout.

Page numbers on the sample pages are formatted as they will be in your thesis but are accurate for this document. As such, the sample title page does not have a page number shown but is actually page v whereas in your thesis, it will actually be page i.

Template Title Page - **Required**

WINTER MICROBIAL CARBON METABOLISM AND COMMUNITY COMPOSITION IN ALASKAN TUNDRA SOIL

by

JANE KATHERINE DOE

B.S., University of Manitoba, 2001

M.S., Oregon State University, 2004

The title and your name should be all caps but not bold.
List each of your previous degrees (but not the one you are about to earn) in chronological order.
Use the degree abbreviation (with or without periods), but do not include your major.

A thesis submitted to the

Faculty of the Graduate School of the

University of Colorado in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy
(full degree name)
Structural Biology and Biochemistry Program
(program or college if College of Nursing)
2015

Template Copyright Page – Optional (only if filing for copyright)

It is uncommon for science dissertations or theses to be copyrighted because much of it is or will be published. The publisher owns the copyright. It is more common for humanities dissertations or theses to be copyrighted.

This thesis for the Master of Science degree by
<full degree name, not abbreviation>
Jane Katherine Doe

bas been approved for the

Template Approval Page (Masters) – **Required for Masters Theses**

Soil Science Program
<program granting the degree>

by

David D. Myrold, Chair

Peter J. Bottomley

Elizabeth Sulzman

Myron Mentor, Advisor

Date: <**last day of the semester**>

Often, the chair of a master's committee is also the advisor. If the advisor is someone other than the chair, indicate with ", Advisor" after their name. If the advisor is not part of the committee, list their name last as in the eample. If the non-chair advisor is on the committee, list after the chair..
Example degrees: Master of Science, Master of Science Clinical Science, Master of Arts, Master of Humanities, etc.
Example Programs: Genetic Counseling Program, Epidemiology Program, History Program, Civil Engineering Program, etc.

Template Approval Page (Doctoral) – **Required for Doctoral Dissertations**

This thesis for the Doctor of Philosophy degree by
<full degree name>
Jane Katherine Doe
<your full name>
has been approved for the

Ecology Program
<program or college (if Nursing) granting the degree>

by

Oliver Chadwick, Chair

Josh P. Schimel, Advisor

Sally MacIntyre

Craig Carlson

Matthew Wallenstein

Date: <last day of the semester>

If the advisor is not part of the committee, list their name last instead of after the chair, as shown in the example.
Examples of Colleges or Programs: College of Nursing, Human Medical Genetics Program, Cancer Biology Program, Applied Mathematics Program, Clinical Health Psychology Program
Do not include degrees (PhD, MD, etc.) or titles (Dr., Professor, etc.) on committee member names.

Template Abstract – **Required**

Doe, Jane Katherine (MS, Soil Science Program)
<Full Name> (<degree abbreviation>, <program or college if CON>
Linking Soluble C to Microbial Community Composition and Dynamics During Decomposition of
<Title Case is Preferred but Sentence Case is Acceptable>
^{13}C-Labeled Ryegrass

Thesis directed by Associate Professor David D. Myrold
Thesis directed by <Advisor's Faculty Title> <Advisor's Full Name>

ABSTRACT

This line indicates how the body of the abstract is to begin. The **body should not exceed 350 words**. The following approval statement must be typed exactly as it appears at the end of the abstract. Just type the advisor's name for approval; signature actually appears on the Statement of Approval page. Do not list any titles or degrees.

The form and content of this abstract are approved. I recommend its publication.

Approved: David D. Myrold

Template Table of Contents – **Required**

TABLE OF CONTENTS

Template List of Tables – **Optional**

LIST OF TABLES

TABLE

Template List of Figures – **Optional**

LIST OF FIGURES

FIGURE

GENERAL INFORMATION FOR SUBMITTING DISSERTATIONS & THESES

You'll find important deadlines and forms on the CU Anschutz Graduate School's website (https://graduateschool.cuanschutz.edu/forms-resources/resources).

You can also contact the CU Anschutz Graduate School Office	Phone: 303.724.2911 Location: W5107 Fitzsimons Building

Copyright

If you have already published portions of your thesis, you might need to get permission from the publishers or copyright owners before you include them in your thesis. This can usually be done simply by e-mail. Include a footnote on the appropriate chapter title that states:

> Portions of this chapter were previously published in <provide reference info like journal, year, issue> and are included with the permission of the copyright holder.

Copyrighted work must also meet the following requirements:

1. The work must represent research conducted while enrolled in the master's or doctoral program and must not have been used to fulfill requirements of another degree.
2. You must be the sole or primary author of the published work; when multi-authored works are included, your contribution and how it relates to the thesis must be clearly explained in the introduction or body of the text.
3. Previously published work must be reformatted to meet Graduate School requirements.

You may have the copyright on your thesis registered through ProQuest for an additional fee. If you have published or will publish your thesis in the future, personal copyright is probably unnecessary. Additional information about copyrighting can be found on the ProQuest website. For more information on copyright, please visit:
US Copyright Office: www.copyright.gov
Fair Use Information: http://copyright.gov/fair-use
ProQuest/UMI: http://media2.proquest.com/documents/UMI_CopyrightGuide.pdf

Responsible Conduct of Research

Every thesis must uphold the utmost level of research and academic integrity. Plagiarism, fabrication, falsification, and other forms of research misconduct will be investigated by the Office of Regulatory Compliance Research Integrity Officer and/or the Research Ethics Committee.

Research on Human Subjects or Animals

If you have performed research involving human subjects, include your COMIRB/IRB protocol number in your Acknowledgements. If you have used live animals, animal tissue or observational animal work, include your IACUC protocol number in your Acknowledgements. Failure to obtain appropriate approvals can have serious consequences including but not limited to your degree not being granted.

Thesis Approval Form

We recommend that from the Graduate School website you download and prepare this form **before your exam**. Take it with you to the exam so that most of your committee members can sign. If you have revisions, we suggest that all but your chair or advisor sign at the exam so that you only have to get one more signature.
All members of your committee must sign in ink. In rare circumstances, a remote committee member may print and sign a separate copy, which should be appended (physically or digitally) to the main copy. Submit the fully executed Thesis Approval Form to the Graduate School before you submit your thesis to ProQuest. We will accept the original inked form or a high quality scan.

Format Review

You must have your thesis reviewed for correct format by your home campus's format review deadline. The thesis you submit to ProQuest after final approval by your committee should be complete and conform to these guidelines. Final acceptance is **required for approval to graduate**.

Proquest Submission Process

All theses are submitted online to ProQuest. When you create your account, make sure you are submitted to your home campus. If you don't see your program listed, you are probably on the wrong campus. Submit your thesis by your home campus's deadline and stay alert for final format revisions, which will be sent through ProQuest to the permanent email you provide in your ProQuest account. All final format review will be handled through ProQuest; please do not email theses after the initial format review.

Costs

Standard electronic publication is free but additional publication options (e.g. copyright) have additional fees. See ProQuest's website for more details.

Embargo

You may choose to place an embargo on your thesis, which will prevent the full thesis from being accessible through the library until either six months, one year or two years after submission (by your choice). Only your title and abstract will be available until the embargo is lifted. Longer embargoes require approval by your degree program and the Graduate School, but are discouraged in most cases because research at this university is to some extent supported by public funds, either directly or indirectly.

Exit Surveys

We value the time our graduates take to provide thoughtful feedback. Doctoral students will be invited to complete the Graduate School Exit Survey and the Survey of Earned Doctorates. Some specialty programs may send additional exit surveys.

MORE DETAILED FORMAT GUIDELINES

If you need additional information or would like to format your thesis differently from the Quick Start Guide, please read this information carefully. Also, consult with your advisor and/or committee about their expectations. Some committees don't like "gathered at the end" placement of tables/figures. The key to formatting your thesis is consistency: use the same font, font size, header style, margins, page number location, etc. throughout your thesis. We only provide guidelines for structural format; please consult a content style guide appropriate to your field for additional guidance on the following:

- Abbreviations and symbols
- Formulas and equations
- Table, figure & graph appearance
- Units & measures
- Hyphens, colons, semicolons, dashes

Examples of such style guides include:

- Publication Manual of the American Psychological Association (APA)
- A Manual for Writers of Term Papers, Theses and Dissertations by Turabian

Thesis Preparation – "Making Thesis Formatting Easier"

It is often easier to start with a properly prepared template than to consistently apply formatting to an existing document. If you use Word to write your thesis, set up Styles to apply your formats. Using Styles allows you to change your format details quickly and easily throughout your thesis. You can also use the Table of Contents tool to automatically create, populate and update an accurate Table of Contents, though you will need to adjust the formatting as Word's automatic formatting does not necessarily meet the Graduate School and ProQuest requirements. If you wish to use LaTeX to format your thesis, templates are available from the Math Department at this link. LaTeX is not a word processor, but rather a "document preparation system for high-quality typesetting" (http://latex-project.org/intro.html). Note that this template is in technical format whereas the Graduate School requirements are more accurately described as traditional format, so you should be prepared to make some modifications to the template as necessary. Note that some obscure fonts in LateX are counter to guidance for good reproduction from ProQuest.

Overall Structure

We require that a written thesis is organized into chapters. Chapter structure can be classified as "chapters as sections" and "chapters as papers." In the "chapters as sections" structure, chapter headings may be similar to sections in a single scholarly paper (e.g. Introduction, Materials & Methods, Results, Discussion, Conclusion, etc). In the "chapters as papers" format, you would start with a global introduction/literature review and end with a global conclusion/summary/future directions. Each paper would be a separate chapter in between. Previously published manuscripts must be formatted per this formatting guide. No matter structure what you choose, it's preferable for the entire document to have only one reference section. If you are not the primary author on the investigative/research chapters of your dissertation/thesis, you should use the format where an introductory chapter is written primarily by you to demonstrate individual scholarship. **Consult with your degree program for its requirements on format before you begin.**
If your discipline necessitates a format other than a written document, please consult with your program for guidance on appropriate structure.

Thesis/Dissertation Organization

Organize your thesis as follows. The **items marked with an asterisk (*) are required in every thesis and dissertation;** other items are optional. ("Thesis" is used below for both, for simplicity.) Examples of these items can be found below. Items 1-10 are collectively known as the "preamble" pages of your thesis.

1. Title Page*
2. Copyright Page (if needed)
3. Approval Page*

4. Abstract*
5. Dedication
6. Acknowledgements
7. Table of Contents* (ToC)
8. List of Tables
9. List of Figures
10. List of Abbreviations ↑ Number these pages with lowercase Roman numerals (e.g. i, ii, iv)

11. Introduction (Chapters)* ↓ Number these pages with Arabic numbers (e.g. 1, 2, 10)
12. Materials and Methods
13. Research chapters
14. Discussion
15. Endnotes
16. Bibliography, Selected Bibliography or References* (note that in some submissions these occur in each chapter)
17. Appendix or Appendices

Typeface/Font

Use a standard font such as Times New Roman, Cambria, Arial, Helvetica or Calibri in 10, 11 or 12 point. If using TeX or LaTeX typesetting, avoid Type 3 fonts.

Use the same font for all text throughout the thesis, including but not limited to headings, paragraph body, quotes, figure captions, table titles, footnotes and page numbers. Text within a table or figure as well as superscript numbers for footnotes/endnotes can be smaller than your main font (as small as 9 pt.). Text within a figure should be legible when the figure is embedded in the thesis.
Equations, formulas and words within figures must also be typed. Handwriting is only permissible within a figure if it is a necessary aspect of the figure (e.g. the figure depicts a handwriting sample).
Computer code can be in any typeface and format.

Margins, Alignment and Pagination

Thesis margins must be at least 1" on all sides. (ProQuest requirement)
Align your text to the left.
Preamble pages (items 1-10 in the Thesis Organization section) are numbered with lowercase Roman numerals (e.g. i, ii, iii, …). The title page is counted as page i but does not have a page number printed on it. The main body of the thesis (items 11-13) are numbers with Arabic numbers starting with 1 on the first page of the first chapter.
Put the page number consistently in the upper right corner, lower right corner or bottom center of the page. Page numbers must be ½" from the top or bottom of the page and 1" from the right side of the page.
Remember that page numbers are the same size and font as the rest of your thesis.

Spacing and Indents

The entire thesis should be double-spaced except for the items listed below, which are single-spaced:

- Footnotes/endnotes

- Long, indented quotes (more than 40 characters; entirely indented from margin)
- Figure legends/captions
- Text inside a table or figure
- Footnotes under a table
- References/bibliography (single-space within entries, double-space between entries)

Do not put extra space between paragraphs.
You should have at least 8" of content per page including the top margin unless you are at the end of a chapter, otherwise you create a "short page". Insert a page break to move a heading of any level to the next page if it is not followed by at least two lines of text.
Indent the first line of each paragraph. For consistency, use the tab key or format your body text style to have an indent built in. Long quotations are indented entirely from the left. See information earlier in this document for examples of different types of indentation and images of the ruler in Word for each.

Headings

Choose a hierarchical style for headings and subheadings; each level of heading should be progressively less eye-catching. The spacing above and below headings must be consistent. Apply your heading styles consistently throughout the thesis, i.e. all Level 1 headings must be the same in every chapter.
Chapter headings are required but all other heading levels are optional. You should follow proper outlining protocol: there must be two or more subheadings below any higher level heading.
If your program/department does not dictate specific heading styles, we offer the following recommendations. Remember that all text is double spaced unless otherwise noted under Spacing and Indents so all headings naturally have a double space before and after them.

Chapter Name: bold, centered, all caps, no additional space
Level 1: bold, centered, upper & lower case (title case)
Level 2: bold, aligned left, upper & lower case (title case)
Level 3: underlined, aligned left, upper & lower case (title case)
Level 4: bold, paragraph indent, first letter cap only (sentence case) followed by period then paragraph text
Level 5: italic, paragraph indent, first letter cap only (sentence case) followed by period then paragraph text

See an earlier section for examples of how you could apply headings.
For title case, capitalize main words; articles, conjunctions and prepositions are not capitalized unless they are the first word. Visit grammar-monster.com for more detailed instructions.
For sentence case, capitalize only the first word and proper nouns (or other special words like acronyms), just like in a sentence.

Title Page

Format your title page following the example page.
Key features:

- Thesis title and your name are all caps.
- All text is centered on the page and double-spaced.
- Your name must be identical on the Title Page, Approval Page and Abstract.
- List all prior academic degrees including location if the institution had multiple campuses. Do not include your major.

- In the block of text at the bottom of the page, use the full name for your degree, the College or Program from which it was granted and the year in which your degree will be granted (not necessarily the same as the year you defended).

Approval Page

Format your approval page following the example page.
Key features:

- All text is centered on the page and double-spaced.
- Like the Title Page, use the full name of your degree and the College or Program from which it was granted.
- If your advisor was on your committee, list second (after Chair); if not, list at end.
- Do not include degrees or titles for committee members.
- **Use the last day of the semester in which the degree will confer, regardless of when you defend/submit.**

Abstract

Format the text at the top of the page as in the example:

- <Last name>, <first name> (<degree abbreviation>, <discipline>)
- Thesis title should be in title case.
- Thesis directed by <advisor's title> <advisor's name> (e.g. Assistant Professor Doe)

Center and bold "ABSTRACT" followed by abstract text.
End with (right-justified):

The form and content of this abstract are approved. I recommend its publication.
Approved: <advisor name, no title or degree>

Dedication

Dedications are optional and personal. If it is long, center the title "DEDICATION" at the top of the page. If it is short, center the dedication on the page and you don't need to use a title as long as it's clear that the text is a dedication.

Acknowledgements

If you are the sole author, Acknowledgements are optional unless you have a COMIRB or IACUC protocol. Acknowledgements also include funding sources and people who contributed to the research and preparation of the thesis.
If you have co-author(s), i.e. other persons made substantive contributions to the research and/or writing of individual chapters, these should be specified on the Acknowledgements page or within the appropriate chapter(s).
If you choose to include Acknowledgements in the preamble of your thesis, center the title "ACKNOWLEDGEMENTS" at the top of the page.
If you choose to include Acknowledgements in your individual chapters, either format your acknowledgements as a footnote on the title of the chapter or include a separate Acknowledgments section at the end of the chapter. If a chapter has been published, this is also a useful place to cite that publication along with assurance that the publisher has waived copyright. (See p. 5 for more information.)

Table of Contents

You must have a Table of Contents (ToC) in your thesis. Follow the sample page formatting.
Key features:

- Title: CONTENTS or TABLE OF CONTENTS centered and bold
- Number the pages of the ToC itself in lowercase Roman numerals
- Minimum: include Chapter titles (numbered with uppercase Roman numerals, all caps)
- Standard: include Level 1 headings (case matching your thesis)
- Advanced: include Level 2+ headings (case matching your thesis)
- "CHAPTER" aligned left with I. <first chapter name> on the subsequent line
- Page numbers aligned right with or without leaders
- Double space all text
- Indent each heading level consistently
- Recommended: Properly format hanging indents to align first letter of multi-line titles
- ToC can also list the preamble pages (i., ii., iii., iv., etc.) or not - optional.

If you properly use the Styles tool in Word to apply your chapter heading style and your level 1 and level 2 heading styles, you can use the Table of Contents tool to automatically generate and easily update the Table of Contents. We highly recommend you do this to ensure accurate page numbers and easy updates as you edit your thesis.
Note that REFERENCES and APPENDIX are not chapters, so are not numbered and are aligned left.
If you have more than one appendix, "number" them with A, B, etc.

List of Tables, List of Figures, List of Maps, Abbreviations

All of these pages are optional and are part of the preamble pages that are numbered in lowercase Roman numerals.
Key features:

- Title: TABLES or LIST OF TABLES, FIGURES or LIST OF FIGURES, etc., ABBREVIATIONS centered and bold
- Number pages in lowercase Roman numerals
- "TABLE," "FIGURE," "MAP" aligned left with entries numbered as in thesis (e.g. 1.2, 3, 4a)
- Page numbers aligned right with or without leaders
- Double space between entries; single space within multi-line titles
- Recommended: Properly format hanging indents to align first letter of multi-line titles

Arrange abbreviations in neat columns and single-space entries if desired.

Chapters

Key features:

- Written theses must be arranged in chapters.
- "CHAPTER X" followed by chapter title also in all caps; double spaced; bold, center.
- Chapters numbers in capital Roman numerals
- Apply format requirements presented in earlier sections throughout chapters (e.g. margins, headings, body text, etc.)

Tables, Figures, Maps, etc.

Tables and figures can EITHER be inserted in-line with the text immediately after their first mention, OR on separate pages. If you use separate pages for your tables/figures, you can either insert the separate page as the next page after mention or gather all tables and figures at the end of the chapter. See Figure 1 for a graphical example. You may put multiple small tables or figures on one page. Consult with your committee/program for their guidance.
Key features:

- Refer to a style guide for the formatting of tables, figures, graphs, etc.
- Must fall within margins (including left border of tables, which Word misaligns).
- Table titles and figure captions are the same size and font as body text.
- Text can be smaller than body text, but should still be readable (esp. in scaled figures).
- Format table titles and figure captions consistently throughout.
- Large tables/figures can be formatted in landscape with top to the left when in portrait, but page number of such items must appear in same position as all other pages.
- Tables/figures can be numbered sequentially through the entire thesis or within each chapter.
- Unless your discipline dictates otherwise:
    - Table titles appear at the top of the table.
    - Figure captions appear at the bottom of the figure.
    - Table footnotes appear at bottom of table.
    - Figure footnotes appear at bottom of figure, above the caption.
    - Caption should be the full width of your page.
- For large figures or those with very long captions, put the caption on the next page, but include the figure number (minimum) or the figure title (recommended) under the figure itself. Figure caption stands alone on next page. Don't break figure captions across pages. See Figure 2 for a graphical example.
- For tables longer than one page, repeat the header row and indicate "Table X cont'd" at the top of each subsequent page.

Figure 1. Three options for figure/table placement. This figure depicts the three acceptable options for placing tables and figures in your thesis. Choose one option and use it consistently throughout.

Figure 2. Common mistakes in figure and caption placement. The right column depicts the correct way to format the aspect of figure placement addressed in that row.

Footnotes/Endnotes

Consult a relevant style manual for the structure of footnotes/endnotes. Use is optional.
Key features:

- Indicated with a superscript number.
- Numbered consecutively through thesis.
- Bibliography should include all references cited in footnotes/endnotes.
- Superscripts may be in a smaller font size; single space within multi-line notes; double space between notes.

Bibliography/References

You must include a bibliography or reference section even if you use footnotes/endnotes. Choose the appropriate format for documenting your sources. A bibliography is a list of sources used or consulted in preparing the thesis. References are a list of sources that are cited in the thesis. Consult your committee, a relevant journal or professional style guide for citation format and reference list format. Apply your citation format consistently throughout your thesis.
We highly recommend using reference management software such as EndNote, Zotero, etc. This will make reformatting references easy if you publish your papers in multiple journals with different formats.
Key features:

- Title: “REFERENCES” or “BIBLIOGRPAHY” or “LIST OF REFERENCES” centered, bold
- Single space within multi-line entries; double space between entries.
- Keep a single entry together (don’t split it across a page break).
- Make sure each page starts with an entry, not a blank line.

Appendix

Key features:

- Optional - listed in Table of Contents when present

- Multiple appendices are delineated with alpha characters (A, B, C, etc.)
- Title: “APPENDIX X” centered, bold
- Page numbers continue from rest of thesis
- Content must fit within margins

Appendix 5

- **Overarching purpose of IGSB**
  - To facilitate student involvement in and represent the interests of students in faculty committees/decision making
  - To organize student-centered events like happy hours, retreats, and journal club
- **The powers invested in the members of IGSB (make rules, govern voting, determine activities and approve them, finances, etc.)**
  - Make rules, govern voting, determine activities and approve them, manage the budget allocated from program leadership for student activities (happy hour, retreat)
- **Organization of members**
  - IGSB members are either committee members or student officers
  - Committee members are student representatives on faculty committees and will interact regularly with faculty members
    - Steering committee representative, student advisory committee, student recruitment committee, student curriculum committee, immunology seminar series committee, faculty recruitment and engagement committee, ORE graduate council representative
  - Officers perform student-facing duties such as organize journal club
    - Director (also steering committee rep), secretary, journal club officers, event and retreat officers, liaison positions, first year representatives
- **Duties of the IGSB**
  - Steering committee representative: 1 student, post-comps (1 year appointment)
    - This responsibility will be delegated to the IGSB director. This student will officially interface with all chairs of the faculty steering committee which is composed of the below listed sub-committees. They are responsible for bringing information from the student body to the attention of faculty and will be the liaison between faculty and student body.
  - Student advisory committee: 3 students, post-comps (2 year appointment)
    - At least 2 of the 3 students MUST be post-comps, but 1 pre-comps student is okay.
    - This committee will have 3 post-comps students who are willing to mentor fellow students. 1st year SAC will have two designated student members, and 2nd year+ SAC will have 1 designated student member. They will appoint other students in the program to perform mentoring tasks such as texting, slack, meetups, and other means of communication will be helpful to check-in and assist mentees. Monthly check-ins will be required. 2 student reps for 1st years and 1 student rep for 2nd+ (3 total reps)
    - Give "how to survive grad school" in September for incoming students and "how to survive comps" talks in January for 2nd years.
      - The "How to survive grad school" talk should include a handout or list of questions for the first years to ask PIs when choosing their rotations
    - Requirements to be a mentor:
      - First year mentees: 2nd-3rd-4th year mentors

- Student recruitment committee: 2 students, post-comps (1 year appointment)
    - At least 1 student MUST be post-comps, and if the second student is pre-comps, the post-comps student will be expected to take the lead and do the majority of the work.
    - These students will work closely with faculty recruitment chairs to help organize and execute recruitment events. They gather and relay student feedback on previous recruitment events to faculty to facilitate improving the recruitment experience. Duties also include organizing the student-recruit dinner event, assembling student volunteers to help with recruitment events (poster session, chalk talks, recruit hosting, general participation in student/faculty dinner events, Q&A session), and creating and maintaining the recruitment slack channel to allow for student-recruit communication. There will also be ~3 5th year students who will be available for early interviews conducted via zoom. Nov-Feb commitment.
- Student curriculum committee: 2 students, post-prelims. (2 year appointment, 1 year offset)
    - These students will gather suggestions for improvements to the immunology class structure. They will also prepare the "intro to immunology techniques course" which will act as a primer for incoming students with limited research experience.
- Immunology seminar series committee: 2-5 students, post comps. (1 year appointment)
    - These immunology students will work with administrators/faculty to secure 1-2 guest lecturers per year. This requires lots of preplanning and administrative interface to secure very busy professors for a talk. Emailing, chauffeuring of speakers, speaker introduction, setting up speaker meals and meetings with students/faculty will be put together by all members of the committee.
- Faculty recruitment and engagement committee: 1 student, post-comps (2 year appointment)
    - This student will participate in recommending and assessing internal faculty members wishing to join the Immunology program as mentors for new students.
- ORE graduate council representatives: 2 students, any time (2-year appointment, 1 year offset).
    - These students work with Angie Ribera (current associate dean of graduate research) to represent the needs and interest of the immunology Ph.D. student body to an authority who can make change. Once/month commitment but interfacing with Ph.D. students to determine the current needs (funding/pay/taxes etc.)
- IGSB director: 1 student, post comps. (1 year appointment)

        - At the first IGSB meeting, the IGSB director will be voted in by the newly elected board. The director will be responsible for running meetings, and interfacing with faculty as the primary representative. They should also be prepared to offer help to all other appointed positions.
    - Secretary: 1 student, post prelims (1 year appointment)
        - This student will organize and determine the best day and location for IGSB meetings (send out doodle poll, meetings are usually in the grad student lounge). Email reminders to IGSB members. Take meeting minutes and send out to IGSB members after each meeting. Organize elections for officers and committee members in April/May.
    - Journal club officer: 2 students, post prelims. (1 year appointment)
        - These students will organize journal club presenter schedule, email weekly the paper topic for JC, compile presentation feedback, procure food (to be reimbursed), and arrange the Pillars of Immunology seminar series which involves reaching out to faculty who are willing to do a pillars talk in the fall, winter, or spring.
    - Event and retreat officers: 2 students, post prelims (1 year appointment)
        - Both students will select dates, determine available funds to secure multiple small events per year (pubs, lunch picnic, shows, laser tag, bowling, etc.) and organize a once-per-year retreat (usually rent a cabin near Mt. Evans). These events should refill our proverbial glasses with libations, fun and scientific discussion alike. In addition, these students will organize rotation talk schedules with admins and faculty and prepare post-rotation talk events (usually meetup at the pub). Students responsible for retreat, will be in charge of procurement of materials/food/games/libations for said retreat. Expenses must be tracked, and reimbursement will be issued by Department Administrator.
        - These students will also be expected to manage the program Twitter account, where they will post about student publications, RIP and journal club topics, student-invited speakers, and fun student activities.
            - They will be responsible for making and checking a Google form that other students can use to submit information about publications, achievements, and other tweet ideas.
    - MSTP/BSP/NJH liaisons: 3 students, post prelims (1 year appointment).
        - These students will work on ways to help integrate these groups, which are often neglected, to encourage more interest. Assist in maintaining and distributing the guide for BSP/MSTP student integration.
        - These positions can overlap with other positions
    - First year representatives: selected by first years to become integrated into IGSB.
- **Eligibility**
    - Pre-prelims students are eligible for:
        - First year representative
        - ORE graduate council representative

- Pre-comps students are eligible for:
    - Student curriculum committee
    - Secretary
    - Journal club officers
    - Event and retreat officers
    - MSTP/BSP/NJH liaisons
- Post-comps students are eligible for the above positions (except first year representative) and the following:
    - Steering committee representative/director
    - Student advisory committee
    - Student recruitment committee
    - Immunology seminar series committee
    - Faculty recruitment and engagement committee

- **Elections**
    - Elections will be held yearly in April-May
    - The secretary will elicit nominations from the student body for each position
        - Students may nominate themselves or other students as long as the nominee's eligibility requirements are met
    - The secretary will reach out individually to nominees to notify them of which positions they are nominated for
        - It is the responsibility of the secretary to keep track of which positions are up for elections each year, since some positions will be elected every other year.
        - Nominees may either accept the nomination to be placed on the ballot, or reject the nomination
    - The secretary will then generate a ballot and send out to the student body for voting
        - For positions that require multiple students, ballot will ask voters to choose students from multiple years to fill the position
            - E.g. Ballot will say something like "Please vote for one third and one fourth year student for recruitment officer"
    - If the minimum number of students are not elected to each position (e.g. only one student is elected for recruitment, only two students are elected for SAC, etc.), it is the responsibility of the elected student in that position to fill the remaining spots before the summer meeting, if possible.
        - They should first contact students who were on the most recent IGSB ballot but did not get elected for a role.
        - If the role is not filled this way, they should reach out to other members of the student body individually.
        - If the role is still unfilled, it will be discussed at the summer IGSB meeting and may be filled by other IGSB members who volunteer.
    - The only role that is not included in elections is first year representative, which is decided among the first years after the beginning of the school year
- **Meetings**
    - Meetings will be held at minimum every quarter and are held in the graduate student lounge in RC1N
        - Early summer to transition into new IGSB, late fall/early winter to discuss recruitment, mid-spring pre-elections
        - More frequent meetings will be held as necessary at the director's discretion
    - Meeting planning
        - Meetings will be initiated by the director through the secretary

        - The secretary will send a when2meet or Doodle Poll to the rest of the members and follow up with a calendar invite after choosing the best time with the director
    - Meeting proceedings
        - Meetings will be led by the director
        - Secretary will take notes on proceedings, which will be sent to the director to approve, then to the student body shortly after the meeting ends
        - Each position will be expected to give a short status update of what they are doing and where they need help from other students or other IGSB members
- **Delinquency and attendance expectations**
    - Members are expected to attend all IGSB meetings to the best of their abilities
- **Procedure for amending bylaws**
    - Bylaw amendments will be brought up at IGSB meetings and voted on by the present members
    - A majority vote is required to pass a bylaw or amendment
    - The secretary will be responsible for updating this bylaw document