MASTER OF SCIENCE IN TOXICOLOGY, PLAN A

Toxicology is the study of the effects of chemicals and other potentially harmful agents on biological systems. The field draws upon the sciences of biology, chemistry, biochemistry, physiology, cell and molecular biology, neuroscience, and pathology. The core curriculum provides a comprehensive background in toxicology, enhanced by elective offerings in the department and the many related basic and health science courses available at CSU.

The M.S. in Toxicology, Plan A, prepares students for industry, government, and academia research careers. Graduates also find professional employment in public and private sector positions such as environmental protection, risk assessment, or product safety evaluation. This program provides an excellent basis for students seeking admission to a doctoral degree program in toxicology or a related field.

Learn more about the Master of Science in Toxicology on the Department of Environmental and Radiological Health Sciences website.

Students interested in graduate work should refer to the Graduate and Professional Bulletin.

Learning Objectives

Students successfully completing this degree will be able to:

1. Analyze and interpret dose-response information in both qualitative and quantitative terms.
2. Describe the fundamental processes of absorption, distribution, metabolism and elimination and the implications of these processes and interpret data related to them.
3. Describe toxic responses affecting organs, physiological systems, cells and biomolecules and interpret related toxicological data.
4. Explain molecular, cellular and physiological mechanisms of toxicity and critically evaluate research results providing evidence for these mechanisms.
5. Describe xenobiotic biotransformation pathways that lead to bioactivation and detoxification.
6. Correctly interpret pathological changes due to toxicant exposure.
7. Analyze and interpret toxicological data.
8. Successfully conduct toxicological research.
9. Describe, analyze and interpret the results of toxicological research in written form.

Requirements Effective Fall 2026

Code	Title	Credits
Core Courses:		
ERHS 502	Fundamentals of Toxicology	3
ERHS 521	Toxicological Pathology	3
ERHS 522	Metabolism and Disposition of Toxic Agents	3
ERHS 523	Toxicological Mechanisms	3
ERHS 693C	Research Seminar: Toxicology	1
Toxicology Courses (select a minimum of 9 credits from the following): [1,2]		**9**
BMS 450	Pharmacology	
ERHS 446	Environmental Toxicology	
ERHS 448	Environmental Contaminants	
ERHS 504	Occupational and Environmental Toxicology	
ERHS 507A	Toxicology Toolbox: Fundamentals	
ERHS 507B	Toxicology Toolbox: Metabolism and Disposition	
ERHS 513	Environmental Carcinogenesis	
ERHS 520	Environmental and Occupational Health Issues	
ERHS 532	Epidemiologic Methods	
or PBHL 570	Epidemiology for Public Health	
ERHS 535	R Programming for Research	
or ERHS 537A	R Programming: Research I	
ERHS 546	Environmental Exposure Assessment	
ERHS 547	Equipment and Instrumentation	
ERHS 549	Environmental Health Risk Assessment	
ERHS 565	Chemical and Biological Warfare Agents	
ERHS 566	Forensic Toxicology	
ERHS 567	Cell and Molecular Toxicology Techniques	
ERHS 568	Pharmaceutical and Regulatory Toxicology	
ERHS 569	Immunotoxicology	
ERHS 658	Environmental and Occupational Epidemiology	
Thesis:		
ERHS 699	Thesis	3-5
Other Requirements:		
Electives [1,2]		3-5
Courses selected based upone the student's scientific and professional interests Approval of the advisor is required.		
Examples of elective courses which complement those taken to meet program requirements include:		
BC 463	Molecular Genetics	
or BC 563	Molecular Genetics	
BC 465	Molecular Regulation of Cell Function	
or BC 565	Molecular Regulation of Cell Function	
BMS 405	Nerve and Muscle-Toxins, Trauma and Disease	
BMS 409	Human and Animal Reproductive Biology	
BMS 420	Cardiopulmonary Physiology	
BMS 430	Endocrinology	
BMS 500	Mammalian Physiology I	
BMS 501	Mammalian Physiology II	
BMS 545	Neuroanatomy	
BMS 640	Reproductive Physiology and Endocrinology	
CM 501	Advanced Cell Biology	
CM 510	Introduction to Cell and Molecular Biology	
ECOL 610	Ecosystem Ecology	
ERHS 526	Industrial Hygiene	
ERHS 596C	Group Study: Toxicology	

ERHS 695C	Independent Study: Toxicology
FSHN 530	Principles of Nutrition Science & Metabolism
FW 544	Ecotoxicology
MIP 555	Principles and Mechanisms of Disease
NB 502	Molecular and Cellular Neurobiology
Any additional course(s) from the Toxicology Electives list beyond the 9 credit requirement	
Program Total Credits:	**30**

A minimum of 30 credits are required to complete this program.

1 No more than 6 credits of courses below 500-level may be included in the program.

2 No more than a total of 3 credits of Internship, Independent Study, Group Study, and Research courses may be included in the program.

Non-Coursework Requirements

Advisor

Students are encouraged to select their major advisor during the first semester, but must do so no later than the end of the second semester. Selection of the major advisor will establish a personal and professional relationship that will have a major impact on the student's growth and subsequent career. The choice of advisor should be based on personal interviews and a familiarity with both the professor's past work and planned work in which the student is likely to be involved. The selection must be mutually acceptable to the student and faculty, and must be approved by the Department Head as indicated on the student's GS6 form. Major advisors must have their primary appointment in Toxicology and have a faculty appointment. Mentors outside of Toxicology are eligible to serve as a student's co-advisors, but not as primary advisor.

Graduate Advisory Committee

The Graduate Advisory Committee for the degree of Master of Science must consist of at least three faculty members. The members are as follows: 1) the advisor who serves as chairperson of the committee and who must hold an academic faculty rank as a professor, associate professor, or assistant professor within the department; 2) one or more additional members from Toxicology or ERHS; and 3) one member from an outside department who, appointed by the Graduate School Dean, represents the Graduate School. The outside committee member must hold a tenure/tenure-track, non-tenure track, transitional, joint, or emeritus faculty appointment at Colorado State University. ERHS faculty affiliates are considered members of ERHS and cannot serve as the outside committee member. Individuals who are not academic faculty but who have special expertise may serve on committees in addition to the prescribed members - however may not vote regarding examination results. The GS6 form detailing the committee must be filed with the Graduate School before the student can register for their fourth semester.

Seminar Requirement

All candidates for the M.S. degree are required to complete a minimum of one credit of a seminar course. Eligible seminar courses include all approved university course listings in seminar format, organized journal clubs taught as Group Studies, CM 792 and ERHS 692. The Graduate Education Committee or individual programs may require additional credits of seminar courses.

Thesis Requirement

Students are required to prepare a thesis based upon research conducted during their program of study that contributes area knowledge. Requires approval of a research proposal, data collection/analysis, and formal oral defense.

Oral Defense Presentation

Each candidate for a Master plan A degree must pass an oral final examination at least five weeks before the expected graduation. This is a public presentation to present research findings with a Q&A session.

Requirements for All Graduate Degrees

For more information, please visit Requirements for All Graduate Degrees (https://catalog.colostate.edu/general-catalog/graduate-bulletin/graduate-study/procedures-requirements-all-degrees/) in the Graduate and Professional Bulletin (https://catalog.colostate.edu/general-catalog/graduate-bulletin/).

Summary of Procedures for the Master's and Doctoral Degrees

NOTE: Each semester the Graduate School publishes a schedule of deadlines. Deadlines are available on the Graduate School website (https://graduateschool.colostate.edu/deadline-dates/). Students should consult this schedule whenever they approach important steps in their careers.

Forms (https://graduateschool.colostate.edu/forms/) are available online.

Step	Due Date
1. Application for admission (online)	Six months before first registration
2. Diagnostic examination when required	Before first registration
3. Appointment of advisor	Before first registration
4. Selection of graduate committee	Before the time of fourth regular semester registration
5. Filing of program of study (GS Form 6)	Before the time of fourth regular semester registration
6. Preliminary examination (Ph.D. and PD)	Two terms prior to final examination
7. Report of preliminary examination (GS Form 16) - (Ph.D. and PD)	Within two working days after results are known
8. Changes in committee (GS Form 9A)	When change is made
9. Application for Graduation (GS Form 25)	Refer to published deadlines from the Graduate School Website
9a. Reapplication for Graduation (online)	Failure to graduate requires Reapplication for Graduation (online) for the next time term for which you are applying
10. Submit thesis or dissertation to committee	At least two weeks prior to the examination or at the discretion of the graduate committee
11. Final examination	Refer to published deadlines from the Graduate School Website

12. Report of final examination (GS Form 24)	Within two working days after results are known; refer to published deadlines from the Graduate School website
13. Submit a signed Thesis/ Dissertation Submission Form (GS Form 30) to the Graduate School and Submit the Survey of Earned Doctorates (Ph.D. only) prior to submitting the electronic thesis/ dissertation	Refer to published deadlines from the Graduate School website.
14. Submit the thesis/dissertation electronically	Refer to published deadlines from the Graduate School website
15. Graduation	Ceremony information is available from the Graduate School website