

MASTER OF SCIENCE IN BIOMEDICAL SCIENCES, PLAN B, ANATOMICAL AND PHYSIOLOGICAL SCIENCES SPECIALIZATION

The Master of Science in Biomedical Sciences, Anatomical and Physiological Sciences Specialization, Plan B with choice of an option is a one-year, non-thesis, coursework-intensive program, with core classes in gross anatomy, physiology, and neurobiology. The program requires the completion of 32 credits and culminates in written comprehensive exams. While much of our coursework prepares students for the rigors of professional school, the curriculum allows for flexibility of electives for students interested in a wide variety of careers.

Students interested in graduate work should refer to the Graduate and Professional Bulletin (<https://catalog.colostate.edu/general-catalog/graduate-bulletin/>). Visit the Department of Biomedical Sciences (<https://vetmedbiosci.colostate.edu/degree-programs/graduate/ms-biomedical-sciences/anatomical-and-physiological-sciences/>) for more information.

Learning Objectives

Students will:

1. Acquire comprehensive knowledge of biomedical science principles by integrating material from core courses in anatomy, physiology, and neuroscience. They will accurately identify and describe anatomical structures using precise terminology and explain key physiological principles, demonstrating their ability to synthesize concepts across these core disciplines.
2. Cultivate advanced critical thinking skills to analyze, interpret, and evaluate novel problems. They will synthesize information from coursework to formulate and communicate well-reasoned solutions.
3. Actively engage in collaborative work, effectively contributing to group projects, study groups, and discussions. They will integrate diverse perspectives from their peers to solve complex problems and communicate collective solutions clearly and efficiently.
4. Develop strong communication skills, effectively conveying complex biomedical concepts in both written and oral formats. They will tailor their communication to diverse audiences, ensuring clarity and precision in presenting scientific information.

Requirements Effective Fall 2026

Human Anatomy Option ¹

Code	Title	Credits
BMS 500	Mammalian Physiology I	4
BMS 501	Mammalian Physiology II	4
BMS 545	Neuroanatomy	5
BMS 575	Human Anatomy Dissection	4
BMS 610A	Managing a Career in Science: Survival Skills for Coursework (M.S.)	1
BMS 619	Advanced Human Gross Anatomy	2

Electives ²	12
Program Total Credits:	32

Neurobiology Option ¹

Code	Title	Credits
BMS 500	Mammalian Physiology I	4
BMS 503/NB 503	Developmental Neurobiology	3
BMS 505/NB 505	Neuronal Circuits, Systems and Behavior	3
BMS 545	Neuroanatomy	5
BMS 610A	Managing a Career in Science: Survival Skills for Coursework (M.S.)	1

Electives ²	16
Program Total Credits:	32

Animal Anatomy Option ¹

Code	Title	Credits
BMS 500	Mammalian Physiology I	4
BMS 501	Mammalian Physiology II	4
BMS 531	Domestic Animal Dissection	3
BMS 545	Neuroanatomy	5
BMS 610A	Managing a Career in Science: Survival Skills for Coursework (M.S.)	1
BMS 633	Domestic Animal Anatomy-Case Discussions	2

Electives ²	13
Program Total Credits:	32

Elective Courses ²

Code	Title	Credits
ANEQ 300A	Topics in Animal Sciences: Livestock Handling	1
ANEQ 300E	Topics in Animal Sciences: Family Ranching	1
ANEQ 300L	Topics in Animal Sciences: Quality Assurance	2
ANEQ 300N	Topics in Animal Sciences: Seedstock Management and Merchandising	3
ANEQ 300R	Topics in Animal Sciences: Ruminant Parturition and Neonatal Care	2
ANEQ 300U	Topics in Animal Sciences: Seedstock Sale Management-Sale Planning	1
ANEQ 300V	Topics in Animal Sciences: Seedstock Sale Management-Sale Management	1
ANEQ 305	Functional Large Animal Physiology	3
ANEQ 310	Animal Reproduction	3
ANEQ 313	Prevention and Control of Livestock Diseases	3
ANEQ 315	Equine Behavior	2
ANEQ 320	Principles of Animal Nutrition	3
ANEQ 321	Principles of Applied Animal Nutrition	1
ANEQ 322	Pet Nutrition	2
ANEQ 323	Zoo Nutrition	2
ANEQ 324	Principles of Applied Equine Nutrition	1
ANEQ 325	Equine Exercise Physiology	2

ANEQ 328	Foundations in Animal Genetics	3	BMS 430	Endocrinology	3
ANEQ 330	Principles of Animal Breeding	3	BMS 450	Pharmacology	3
ANEQ 334	Principles of Equine Genetics	3	BMS 460	Essentials of Pathophysiology	3
ANEQ 360	Principles of Meat Science	3	BMS 461	Pathophysiology Perspectives	2
ANEQ 444	Equine Business Management	2	BMS 487	Internship	1-6
ANEQ 445	Foaling Management	2	BMS 498	Research	1-3
ANEQ 522	Animal Metabolism	3	BMS 501	Mammalian Physiology II	4
ANEQ 551	Field Necropsy	2	BMS 502/NB 500	Readings in Cellular Neurobiology	1
ANTH 372	Human Osteology	3	BMS 503/NB 503	Developmental Neurobiology	3
ANTH 373	Human Evolution	3	BMS 505/NB 505	Neuronal Circuits, Systems and Behavior	3
ANTH 379	Evolutionary Medicine and Human Health	3	BMS 521	Comparative Reproductive Physiology	3
ANTH 423	Cultural Psychiatry	3	BMS 531	Domestic Animal Dissection	3
ANTH 472	Human Biology	3	BMS 575	Human Anatomy Dissection	4
ANTH 474	Human Skeleton Analysis	3	BMS 619	Advanced Human Gross Anatomy	2
ANTH 530	Human-Environment Interactions	3	BMS 631	Mechanisms of Hormone Action	2
ANTH 538	Food, Hunger, and Culture	3	BMS 632	Metabolic Endocrinology	2
ANTH 540	Medical Anthropology	3	BMS 633	Domestic Animal Anatomy-Case Discussions	2
ANTH 546	Culture, Mind, and Cognitive Science	3	BMS 640	Reproductive Physiology and Endocrinology	4
ANTH 547	Mind, Medicine, and Culture	4	BMS 642	Research Techniques for Gametes and Embryos	1
BC 351	Principles of Biochemistry	4	BMS 643	Applied Andrology	2
BC 353	Pre-Health Genetics	4	BMS 684	Supervised College Teaching	1-18
BC 401	Comprehensive Biochemistry I	3	BMS 692	Seminar-Classics in Neurosciences	1
BC 403	Comprehensive Biochemistry II	3	BMS 695A	Independent Study: Developmental Anatomy	1-18
BC 411	Physical Biochemistry	4	BMS 695B	Independent Study: Microscopic Anatomy	1-18
BC 463	Molecular Genetics	3	BMS 695C	Independent Study: Neuroanatomy	1-18
BC 464	Molecular Genetics Recitation	1	BMS 695D	Independent Study: Radiographic Anatomy	1-18
BC 465	Molecular Regulation of Cell Function	3	BMS 695E	Independent Study: Surgical Anatomy	1-18
BC 467	Biochemistry of Disease	3	BMS 695F	Independent Study: Gross Anatomy	1-18
BC 563	Molecular Genetics	4	BMS 696	Group Study-Neurosciences	1-3
BC 565	Molecular Regulation of Cell Function	4	BMS 742	Ethical Issues in Human Assisted Reproduction	1
BIOM 550	STEM Communication	1	BMS 784	Supervised College Teaching	1-18
BMS 300	Principles of Human Physiology	4	BMS 792A	Seminar: Biomedical Sciences	1-5
BMS 301	Human Gross Anatomy	5	BMS 792B	Seminar: Neurophysiology	1-5
BMS 302	Laboratory in Principles of Physiology	2	BMS 792C	Seminar: Reproductive Physiology	1-5
BMS 304	Applied Food and Fiber Animal Anatomy	3	BMS 795A	Independent Study: Endocrinology	1-18
BMS 305	Domestic Animal Gross Anatomy	4	BMS 795B	Independent Study: Neurophysiology	1-18
BMS 310	Anatomy for the Health Professions	4	BMS 795C	Independent Study: Cell Physiology	1-18
BMS 320	Virtual Laboratory in Physiology	2	BMS 795D	Independent Study: Cardiopulmonary Physiology	1-18
BMS 325	Cellular Neurobiology	3	BMS 795E	Independent Study: Reproductive Physiology	1-18
BMS 330	Microscopic Anatomy	4	BMS 796A/NB 796C	Group Study: Topics in Neuroscience	1-4
BMS 345	Functional Neuroanatomy	4	BMS 796B	Group Study: Cardiopulmonary Physiology	1-18
BMS 360	Fundamentals of Physiology	4	BMS 796C	Group Study: Reproductive Physiology	1-18
BMS 384	Supervised College Teaching	1-5	BZ 300	Animal Behavior	3
BMS 400	Neuroanatomy Through Clinical Case Studies	1	BZ 310	Cell Biology	4
BMS 401	Laboratory Research in Biomedical Sciences	4	BZ 311	Developmental Biology	4
BMS 405	Nerve and Muscle-Toxins, Trauma and Disease	3	BZ 350	Molecular and General Genetics	4
BMS 409	Human and Animal Reproductive Biology	3			
BMS 420	Cardiopulmonary Physiology	3			
BMS 421	Perspectives in Cardiopulmonary Diseases	2			
BMS 425	Introduction to Systems Neurobiology	3			

BZ 390	Biology of Sex	3	FSHN 445/HDFS 445	Early Childhood Health, Safety, and Nutrition	3
BZ 401	Comparative Animal Physiology	3	FSHN 451	Community Nutrition	3
BZ 418	Ecology of Infectious Diseases	4	FSHN 453	Biology of Body Weight Regulation	3
BZ 420	Evolutionary Medicine	3	FSHN 455	Food Systems—Impact on Health/Food Security	2
BZ 455	Human Heredity and Birth Defects	3	FSHN 459	Nutrition in the Life Cycle	3
BZ 478/VS 478	Biology and Behavior of Cats	3	FSHN 504	Micronutrients	3
BZ 479/VS 479	Biology and Behavior of Dogs	3	FSHN 505	Nutrition and Physical Activity in Aging	3
BZ 515	Physiological Ecology of Marine Vertebrates	3	FSHN 506	Nutrition and Human Performance	3
CHEM 341	Modern Organic Chemistry I	3	GRAD 544	Ethical Conduct of Research	1
CHEM 343	Modern Organic Chemistry II	3	HDFS 332	Death, Dying, and Grief	3
CHEM 344	Modern Organic Chemistry Laboratory	2	HDFS 310	Infant and Child Development	3
CHEM 346	Organic Chemistry II	4	HDFS 311	Adolescent and Emerging Adult Development	3
CHEM 461	Inorganic Chemistry	3	HDFS 312	Adult Development and Aging	3
CHEM 462	Inorganic Chemistry Laboratory	2	HDFS 475	Leadership and Advocacy in Human Services	3
CM 501	Advanced Cell Biology	4	HES 420	Electrocardiography and Exercise Management	3
CM 644/E 644	Creative Science Writing	3	HES 403	Physiology of Exercise	3
CO 300	Writing Arguments (GT-CO3)	3	HES 404	Physiology of Exercise Laboratory	1
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)	3	HES 300	Physiology for Clinical Health Professions	4
CO 301D	Writing in the Disciplines: Education (GT-CO3)	3	HES 345	Population Health and Disease Prevention	3
EDAE 520	Adult Education	3	HES 319	Neuromuscular Aspects of Human Movement	4
EDAE 521	Introduction to Learning Design and Training	1	HES 379	Psychology and Sport	3
EDAE 620	Processes and Methods	3	HES 340	Exercise Prescription	3
EDAE 624	Adult Teaching and Learning I	3	HES 434	Physical Activity Throughout the Lifespan	3
EDAE 639	Instructional Design	3	HES 450	Introduction to Human Clinical Medicine	3
EDAE 664	Assessment and Evaluation in Adult Education	3	HES 610	Exercise Bioenergetics	3
EDUC 461A	Secondary Science and Technology Education I	3	HES 500	Environmental Exercise Physiology	3
EDUC 461B	Secondary Science and Technology Education II	3	JTC 319	Science and Environmental Communication	3
ERHS 446	Environmental Toxicology	3	LSPA 300	Reading and Writing for Communication-Spanish	3
ERHS 501	Disease in Public Health Action	2	LSPA 301	Oral Communication-Spanish	3
ERHS 503	Toxicology Principles	1	LSPA 313	Introduction to Spanish Translation and Interpreting	3
ERHS 510/VS 510	Cancer Biology	3	LSPA 335	Issues in Hispanic Culture	3
ERHS 550	Principles of Radiation Biology	5	LSPA 340A	Animal Health Spanish: Routines and Preventive Care	3
ERHS 566	Forensic Toxicology	3	LSPA 340B	Animal Health Spanish: Health and Handling	3
ERHS 569	Immunotoxicology	3	LSPA 345	Business Spanish	3
ETST 305	Ethnicity, Class, and Gender in the U.S.	3	LSPA 346A	Medical Spanish: An Overview	3
ETST 410	Advanced Topics in African American Studies	3	LSPA 346B	Medical Spanish: Clinical Tasks	3
FSHN 350	Human Nutrition	3	LSPA 347	Spanish for Working with Youth and Families	3
FSHN 470	Advanced Human Nutrition and Metabolism	3	LSPA 348	Spanish Professional Terminology in Context	3
FSHN 444	Nutrition and Aging	1	LSPA 413	Advanced Spanish Translation and Interpreting	3
FSHN 450	Medical Nutrition Therapy	3	MGT 305	Fundamentals of Management	3
FSHN 449	Pathophysiology of Nutrition-Related Diseases	2			
FSHN 420	Advanced Sports Nutrition	3			
FSHN 435	Lactation Benefits and Promotion	2			

MIP 300	General Microbiology	3
MIP 302	General Microbiology Laboratory	2
MIP 303	General Microbiology–Honors Recitation	1
MIP 315	Pathology of Human and Animal Disease	3
MIP 334	Food Microbiology	3
MIP 335	Food Microbiology Laboratory	2
MIP 342	Immunology	4
MIP 343	Immunology Laboratory	2
MIP 351	Medical Bacteriology	3
MIP 352	Medical Bacteriology Laboratory	3
MIP 355	CURE – Phage Discovery and Genetics	3
MIP 410	Foundations of Modern Biotechnology	2
MIP 420	Medical and Molecular Virology	4
MIP 425	Virology and Cell Culture Laboratory	2
MIP 432/ESS 432	Microbial Ecology	3
MIP 433/ESS 433	Microbial Ecology Laboratory	1
MIP 443	Microbial Physiology	3
MIP 450	Microbial Genetics	3
MIP 462/BSPM 462/ BZ 462	Parasitology and Vector Biology	5
MIP 495	Independent Study	1-18
MIP 496	Group Study	1-3
NB 475	Mentored Research in Neuroscience	3
NB 500/BMS 502	Readings in Cellular Neurobiology	1
NB 501	Cellular and Molecular Neurophysiology	2
NB 502	Molecular and Cellular Neurobiology	2
NB 506	Neuroscience of Disease	2
NB 793	Neuroscience Seminar	1
NB 796E	Group Study: Neuroendocrine Mechanisms	1-18
PHIL 315	Philosophy of Language	3
PHIL 322	Biomedical Ethics	3
PHIL 326	Philosophy of Biology	3
PHIL 354	Philosophy and Science Fiction	3
PHIL 407	Phenomenology and Existentialism	3
PSY 300	Positive Psychology	3
PSY 315	Social Psychology	3
PSY 320	Psychopathology	3
PSY 325	Psychology of Personality	3
PSY 330	Clinical and Counseling Psychology	3
PSY 352	Learning and Memory	3
PSY 360	Psychology of Drug Addiction Treatment	3
PSY 437	Psychology of Gender	3
PSY 458	Cognitive Neuroscience	3
PSY 515	Women's Health	3
PSY 517/IE 517	Perspectives in Global Health	3
SOCR 330	Principles of Genetics	3
VS 301	Human-Animal Interactions	3
VS 331	Histology	4
VS 333	Domestic Animal Anatomy	4
VS 410	Pets Forever – Supporting the Life-Long Bond	3

VS 495	Independent Study	1-18
VS 501	Animal Behavior and Welfare	2

A minimum of 32 credits are required to complete this program.

- ¹ Written comprehensive exam will fulfill requirements of the Plan B. Exams take place after coursework is complete.
- ² Students may have a reason to take an elective outside this list that will contribute to their chosen profession. Should this situation arise, the student will work with their academic advisor and graduate education committee to approve the most appropriate electives for their course of study.

At the end of their coursework, students will complete a written common comprehensive examination to satisfy the Plan B requirement. The exam will cover the 4 core courses in their plan of study and will be held in the summer term.

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