MAS Elective Courses

- **At least 17 credits required. Any elective courses selected must differ from those taken to fulfill core course requirements.**

✓ Additional elective courses not on the general elective course list may be included in MAS degree plan of work with mentor's permission and DGP approval.

General Departmental Listings for MAS Graduate Program Elective Courses:

Agriculture and Extension Education

AEE 426 - Methods of Teaching Agriculture
AEE 470 - Agricultural Communications
AEE 478 - Extension as Non-Formal Education
AEE 500 - Agricultural Education, Schools and Society
AEE 501 - Foundations of Agricultural and Extension Education
AEE 503 - Youth Program Management
AEE 505 - Trends and Issues in Agricultural and Extension Education
AEE 507 - Comparative Agricultural and Extension Education
AEE 521 - Program Planning in Agricultural and Extension Education
AEE 522 - Occupational Experience in Agriculture
AEE 523 - Adult Education in Agriculture
AEE 526 - Information Technologies in Agricultural and Extension Education
AEE 528 - Instructional Design in Agricultural and Extension Education
AEE 529 - Curriculum Development in Agricultural and Extension Education
AEE 530 - Priority Management in Agricultural and Extension Education
AEE 534 - Mentoring in Agricultural and Extension Education
AEE 535 - Teaching Agriculture in Secondary Schools
AEE 560 - Organizational and Administrative Leadership in Agricultural and Extension Education
AEE 577 - Evaluation in Agricultural and Extension Education
AEE 578 - Scientific Inquiry in Agricultural and Extension Education
AEE 735 - Effective Teaching in Agriculture and Life Sciences
AEE 740 - Extension in Developing Countries

Animal Science

ANS 530 - Advanced Applied Animal Reproduction
ANS 531 - Advanced Applied Animal Reproduction Lab
ANS 540 - Selection of Domestic Animals
ANS 550 - Applied Ruminant Nutrition
ANS 552 - Advanced Reproductive Physiology & Biotechnology
ANS 553 - Growth and Development of Domestic Animals
ANS 554 - Lactation, Milk, and Nutrition
ANS 571 - Regulation of Metabolism
ANS 575 - Current Topics in Genomics and Proteomics in Animal Science

ANS 602 - Seminar In Biology of Reproduction
ANS 603 - Reproductive Physiology Seminar
ANS 604 - Animal Breeding and Genetics Seminar
ANS 610 - Topical Problems in Animal Science
ANS 685 - Master's Supervised Teaching
ANS 701 - Protein and Amino Acid Metabolism
ANS 702 - Reproductive Physiology of Mammals
ANS 706 - Mammalian Embryo Manipulation
ANS 708 - Genetics of Animal Improvement
ANS 709 - Energy Metabolism
ANS 713 - Quantitative Genetics and Breeding
ANS 764 - Advances in Gastrointestinal Pathophysiology
ANS 775 - Mineral Metabolism
ANS 780 - Mammalian Endocrinology
ANS 785 - Digestion and Metabolism in Ruminants

Agricultural Resource Economics

ARE 401 - Economic Analysis for Non-Majors
ARE 403 - Economics of Consumer Decisions
ARE 412 - Marketing Analysis and Plans for Agribusiness and Life Sciences
ARE 423 - Futures and Options Markets
ARE 433 - U.S. Agricultural Policy
ARE 436 - Environmental Economics

Biological and Agricultural Engineering

BAE 432 - Agricultural and Environmental Safety and Health
BAE 435 - Precision Agriculture Technology
BAE 440 - Geographic Information Systems in Production Agriculture
BAE 442 - Systems Approach to Agricultural and Environmental Issues
BAE 472 - Irrigation and Drainage
BAE 501 - Instrumentation for Biological Systems
BAE 535 - Precision Agriculture Technology
BAE 570 - Soil Water Movement
BAE 572 - Irrigation and Drainage
BAE 576 - Watershed Monitoring and Assessment
BAE 578 - Agricultural Waste Management
BAE 780 - Transport and Fate Of Chemicals In Soils and Natural Waters

Business Administration

MBA 514 - Technology, Law, and the Internet
MBA 554 - Project Management
MBA 570 - Entrepreneurship
MBA 576 - Technology Evaluation and Commercialization Concepts
MBA 577 - High Technology Entrepreneurship
MBA 590B – Management Foundations

MBA 590G - Issues in Global Healthcare
MBA 590K - Issues in BioSciences Management and Strategy (to become MBA 595)
MBA 590V - Legal and Market Issues in the Life Scheices (to become MBA 586)

Business Management

BUS 500 – Strategic Management
BUS 501 - Legal and Regulatory Environment In Management
BUS 590B – Management Foundations

Molecular and Structural Biochemistry

BCH 451 - Principles of Biochemistry
BCH 452 - Introductory Biochemistry Laboratory
BCH 453 - Biochemistry of Gene Expression
BCH 454 - Advanced Biochemistry Laboratory
BCH 455 - Proteins and Molecular Mechanisms
BCH 552 - Experimental Biochemistry
BCH 553 - Biochemistry of Gene Expression
BCH 555 - Proteins and Molecular Mechanisms
BCH 571 - Regulation of Metabolism
BCH 703 - Macromolecular Synthesis and Regulation
BCH 705 - Molecular Biology of the Cell
BCH 751 - Biophysical Chemistry
BCH 761 - Advanced Molecular Biology of the Cell
BCH 763 - Biochemistry of Hormone Action
BCH 768 - Nucleic Acids: Structure and Function

Biotechnology

BIT 410 - Manipulation of Recombinant DNA
BIT 461 - Sequencing cDNA Libraries
BIT 462 - Gene Expression Analysis: Microarrays
BIT 463 - Fermentation of Recombinant Microorganisms
BIT 464 - Protein Purification
BIT 465 - Real-time PCR Techniques
BIT 466 - Animal Cell Culture Techniques
BIT 467 - PCR and DNA Fingerprinting
BIT 468 - Genome Mapping
BIT 470 - Advanced Animal Cell Culture: Bioreactor Culture
BIT 501 - Ethical Issues in Biotechnology
BIT 510 - Core Technologies in Molecular and Cellular Biology
BIT 562 - Gene Expression: Microarrays
BIT 564 - Protein Purification
BIT 565 - Real-time PCR Techniques
BIT 566 - Animal Cell Culture Techniques
BIT 568 - Genome Mapping
BIT 569 - RNA Purification and Analysis

Comparative Biomedical Sciences

CBS 662 - Professional Conduct in Biomedical Research
CBS 730 - Veterinary Histology
CBS 731 - Applied Veterinary Anatomy I
CBS 732 - Biological Light and Electron Microscopy: Principles and Practice
CBS 740 - Research Animal Care and Use
CBS 753 - Veterinary Immunology
CBS 754 - Principles Of Analytical Epidemiology
CBS 755 - Immunoparasitology
CBS 756 - Immunogenetics
CBS 760 - Molecular Epidemiology of Infectious Diseases of Veterinary and Public Health Importance
CBS 762 - Principles of Pharmacology
CBS 770 - Cell Biology
CBS 771 - Cancer Biology
CBS 773 - Advanced Developmental Biology
CBS 774 - Epidemiology Of Infectious Diseases Of International Importance
CBS 780 - Veterinary Production Epidemiology
CBS 782 - Marine Mammal Medicine
CBS 783 - Advanced Immunology
CBS 785 - Advanced and Molecular Pharmacology
CBS 787 - Pharmacokinetics
CBS 861 - Bacterial Pathogenic Mechanisms

Crop Science

CS 411 - Crop Ecology
CS 414 - Weed Science
CS 415 - Integrated Pest Management
CS 430 - Advanced Agroecology
CS 440 - Geographic Information Systems in Production Agriculture
CS 462 - Soil-Crop Management Systems
CS 717 - Weed Management Systems
CS 718 - Biological Control Of Weeds

Economics

EC 401 - Economic Analysis for Non-majors
EC 404 - Money, Financial Markets, and the Economy
EC 410 - Public Finance
EC 413 - Competition, Monopoly and Public Policy
EC 431 - Labor Economics
EC 435 - Urban Economics
EC 436 - Environmental Economics
EC 437 - Health Economics
EC 442 - Evolution of Economic Ideas
EC 448 - International Trade

EC 449 - International Finance
EC 451 - Introduction to Econometrics
EC 470 - The Japanese Economy
EC 471 - Evolution of the American Economy
EC 472 - The Rise of Industrialism
EC 474 - Economics of Financial Institutions and Markets

Economics-Graduate

ECG 504 - Monetary and Financial Macroeconomics
ECG 505 - Applied Microeconomic Analysis
ECG 506 - Applied Macroeconomic Analysis
ECG 507 - Economics for Managers
ECG 508 - Macroeconomics and the Business Environment
ECG 512 - Law and Economics
ECG 515 - Environmental and Resource Policy
ECG 521 - Markets and Trade
ECG 523 - Planning Farm and Area Adjustments
ECG 532 - Economics of Trade Unions
ECG 533 - Economics of World Food and Agricultural Policy
ECG 537 - Health Economics
ECG 540 - Economic Development
ECG 551 - Agricultural Production Economics
ECG 555 - Managerial Economics
ECG 570 - Analysis of American Economic History
ECG 700 - Fundamentals of Microeconomics
ECG 703 - Fundamentals of Macroeconomics
ECG 706 - Industrial Organization
ECG 708 - History of Economic Thought
ECG 710 - Theory of Public Finance
ECG 715 - Environmental and Resource Economics
ECG 730 - Labor Economics
ECG 741 - Agricultural Production and Supply
ECG 742 - Consumption, Demand and Market Interdependency
ECG 748 - Theory of International Trade
ECG 749 - Monetary Aspects of International Trade

Entomology

ENT 425 - General Entomology
ENT 502 - Insect Systematics
ENT 503 - Insect Morphology and Physiology
ENT 550 - Fundamentals Of Insect Control
ENT 582 - Medical and Veterinary Entomology
ENT 722 - Insecticide Toxicology
ENT 726 - Biological Control of Insects and Weeds
ENT 762 - Insect Pest Management In Agricultural Crops

Food Science

FS 400 - Principles of Human Nutrition
FS 402 - Chemistry of Food and Bioprocessed Materials
FS 403 - Analytical Techniques in Food & Bioprocessing Science
FS 405 - Food Microbiology
FS 406 - Food Microbiology Lab
FS 407 - Risk Analysis and Hazard Analysis in Food Safety
FS 416 - Quality Control in Food and Bioprocessing
FS 421 - Food Preservation
FS 453 - Food Laws and Regulations
FS 462 - Postharvest Physiology
FS 520 - Pre-Harvest Food Safety
FS 530 - Post-Harvest Food Safety
FS 540 - Food Safety and Public Health
FS 553 - Food Laws and Regulations
FS 554 - Lactation, Milk, and Nutrition
FS 555 - Exercise Nutrition
FS 562 - Post-harvest Physiology
FS 567 - Sensory Analysis of Foods
FS 580 - Professional Development and Ethics in Food Safety
FS 706 - Vitamin Metabolism
FS 710 - Food Lipids
FS 725 - Fermentation Microbiology
FS 730 - Human Nutrition

Fisheries and Wildlife Sciences

FW 453 - Principles of Wildlife Science
FW 485 - Natural Resources Advocacy
FW 515 - Fish Physiology
FW 553 - Principles of Wildlife Science
FW 560 - International Wildlife Management and Conservation
FW 585 - Advanced Wildlife Habitat Management
FW 586 - Aquaculture I

Genetics

GN 412 - Elementary Genetics Laboratory
GN 413 - Advanced Genetics
GN 414 - Genes and Development
GN 415 - Genome Science
GN 504 - Human Genetics
GN 513 - Advanced Genetics
GN 701 - Molecular Genetics
GN 702 - Cellular and Developmental Genetics
GN 703 - Population and Quantitative Genetics
GN 708 - Genetics of Animal Improvement

GN 713 - Quantitative Genetics and Breeding
GN 721 - Genetic Data Analysis
GN 735 - Functional Genomics
GN 740 - Evolutionary Genetics
GN 750 - Developmental Genetics
GN 755 - Population Genetics
GN 757 - Statistics for Molecular Quantitative Genetics
GN 758 - Prokaryotic Molecular Genetics
GN 760 - Experimental Microbial Genetics
GN 761 - Advanced Molecular Biology of the Cell
GN 768 - Nucleic Acids: Structure and Function
GN 770 - Statistical Concepts in Genetics

Genomic Sciences

GS 735 - Functional Genomics
GS 850 - Professionalism and Ethics

Immunology

IMM 705 - Immunotoxicology
IMM 751 - Immunology
IMM 755 - Immunoparasitology
IMM 756 - Immunogenetics
IMM 757 - Avian Immunology
IMM 783 - Advanced Immunology

Microbiology

MB 405 - Food Microbiology
MB 406 - Food Microbiology Lab
MB 411 - Medical Microbiology
MB 412 - Medical Microbiology Laboratory
MB 414 - Microbial Metabolic Regulation
MB 441 - Immunology
MB 451 - Microbial Diversity
MB 455 - Microbial Biotechnology
MB 461 - Introduction to Molecular Virology
MB 714 - Microbial Metabolic Regulation
MB 718 - Introductory Virology
MB 725 - Fermentation Microbiology
MB 735 - Pathogenic Microbiology
MB 751 - Immunology
MB 756 - Immunogenetics
MB 758 - Prokaryotic Molecular Genetics
MB 771 - Molecular Virology of Animal Viruses
MB 783 - Advanced Immunology

Nutrition

NTR 400 - Principles of Human Nutrition
NTR 415 - Comparative Nutrition
NTR 419 - Human Nutrition in Health and Disease
NTR 420 - Community and Life Cycle Nutrition
NTR 500 - Principles of Human Nutrition
NTR 550 - Applied Ruminant Nutrition
NTR 554 - Lactation, Milk, and Nutrition
NTR 555 - Exercise Nutrition
NTR 560 - Nutrition and Biotechnology
NTR 701 - Protein and Amino Acid Metabolism
NTR 706 - Vitamin Metabolism
NTR 708 - Energy Metabolism
NTR 710 - Food Lipids
NTR 730 - Human Nutrition
NTR 764 - Advances in Gastrointestinal Pathophysiology
NTR 775 - Mineral Metabolism
NTR 785 - Digestion and Metabolism in Ruminants

Philosophy

PHI 415 - Life Science Ethics
PHI 420 - Global Justice
PHI 422 - Philosophical Issues in Environmental Ethics
PHI 425 - Introduction to Cognitive Science
PHI 440 - The Scientific Method
PHI 445 - Philosophy of Biology
PHI 450 - Software and the Ethics of Ownership
PHI 475 - Ethical Theory
PHI 515 - Life Science Ethics
PHI 520 - Global Justice
PHI 522 - Philosophical Issues in Environmental Ethics
PHI 540 - The Scientific Method
PHI 545 - Philosophy of Biology
PHI 550 - Software and the Ethics of Ownership
PHI 575 - Ethical Theory
PHI 816 - Introduction to Research Ethics

Physiology

PHY 503 - General Physiology I
PHY 504 - General Physiology II
PHY 513 - Comparative Physiology
PHY 524 - Comparative Endocrinology
PHY 552 - Advanced Reproductive Physiology & Biotechnology
PHY 702 - Reproductive Physiology of Mammals
PHY 756 - Immunogenetics

PHY 764 - Advances in Gastrointestinal Pathophysiology
PHY 780 - Mammalian Endocrinology

Poultry Science

PO 405 - Avian Physiology
PO 410 - Production and Management of Game Birds in Confinement
PO 415 - Comparative Nutrition
PO 421 - Commercial Egg Production
PO 422 - Incubation and Hatchery Management
PO 424 - Poultry Meat Production
PO 425 - Feed Mill Management and Feed Formulation
PO 430 - Poultry Breeding
PO 435 - Poultry Incubation & Breeding
PO 505 - Physiological Aspects of Poultry Management
PO 524 - Comparative Endocrinology
PO 566 - Animal Cell Culture
PO 702 - Biotechniques in Avian Biology
PO 756 - Immunogenetics
PO 757 - Current Concepts in Avian Immunology
PO 775 - Mineral Metabolism

Plant Pathology

PP 530 - Agriculture, Ethics and the Environment

Soil Science

SSC 435 - Precision Agriculture Technology
SSC 440 - Geographic Information Systems in Production Agriculture
SSC 452 - Soil Classification
SSC 461 - Soil Physical Properties and Plant Growth
SSC 462 - Soil-Crop Management Systems
SSC 470 - Wetland Soils
SSC 472 - Forest Soils
SSC 532 - Soil Microbiology
SSC 535 - Precision Agriculture Technology
SSC 541 - Soil Fertility
SSC 545 - Remote Sensing Applications in Soil Science and Agriculture
SSC 551 - Soil Morphology, Genesis and Classification
SSC 562 - Environmental Applications of Soil Science
SSC 570 - Wetland Soils
SSC 701 - Tropical Soils: Characteristics and Management
SSC 780 - Transport and Fate of Chemicals in Soils and Natural Waters

Statistics

ST 430 - Introduction to Regression Analysis
ST 431 - Introduction to Experimental Design

ST 432 - Introduction to Survey Sampling
ST 435 - Statistical Methods for Quality and Productivity Improvement
ST 445 - Introduction to Statistical Computing and Data Management
ST 505 - Applied Nonparametric Statistics
ST 506 - Sampling Animal Populations
ST 511 - Experimental Statistics for Biological Sciences I
ST 512 - Experimental Statistics for Biological Sciences II
ST 520 - Statistical Principles of Clinical Trials and Epidemiology
ST 524 - Statistics in Plant Science
ST 546 - Probability and Stochastic Processes I
ST 708 - Applied Least Squares
ST 711 - Design Of Experiments
ST 715 - Theory Of Sampling Applied To Survey Design
ST 721 - Genetic Data Analysis
ST 730 - Applied Time Series Analysis
ST 731 - Applied Multivariate Statistical Analysis
ST 732 - Applied Longitudinal Data Analysis
ST 733 - Applied Spatial Statistics
ST 747 - Probability and Stochastic Processes II
ST 748 - Stochastic Differential Equations
ST 757 - Statistics for Molecular Quantitative Genetics
ST 770 - Statistical Concepts In Genetics
ST 771 - Biomathematics I
ST 772 - Biomathematics II

Toxicology

TOX 401 - Principles of Toxicology
TOX 415 - Environmental Toxicology and Chemistry
TOX 501 - Principles of Toxicology
TOX 628 - Principles of Reproductive and Developmental Toxicology Research
TOX 701 - General Toxicology
TOX 704 - Chemical Risk Assessment
TOX 705 - Immunotoxicology
TOX 710 - Biochemical Toxicology
TOX 715 - Environmental Toxicology
TOX 721 - Chemical Carcinogenesis
TOX 722 - Insecticide Toxicology
TOX 727 - Pesticide Behavior and Fate in the Environment
TOX 771 - Cancer Biology

Veterinary Science and Veterinary Public Health

VMC 962 - Animal Welfare, Ethics and Societal Responsibility
VMP 420 - Diseases of Farm Animals
VPH 554 - Trade and Agricultural Health
VPH 555 - Public Health, Sustainable Development and Gender in Global Context

Zoology

ZO 402 - Invertebrate Zoology
ZO 405 - Functional Histology
ZO 410 - Introduction to Animal Behavior
ZO 412 - Human Anatomy
ZO 414 - Cell Biology
ZO 420 - Introduction to Fisheries Science
ZO 421 - Principles of Physiology
ZO 422 - Biological Clocks
ZO 425 - General Entomology
ZO 430 - Fisheries and Wildlife Administration
ZO 441 - Biology of Fishes
ZO 449 - Principles of Biological Oceanography
ZO 450 - Evolutionary Biology
ZO 480 - Laboratory Techniques in Cellular Biology
ZO 488 - Neurobiology
ZO 503 - General Physiology I
ZO 504 - General Physiology II
ZO 508 - Brain, Sex and Gender
ZO 512 - Animal Symbiosis
ZO 513 - Comparative Physiology
ZO 515 - Fish Physiology
ZO 522 - Biological Clocks
ZO 524 - Comparative Endocrinology
ZO 544 - Mammology
ZO 553 - Principles of Wildlife Science
ZO 582 - Medical and Veterinary Entomology
ZO 586 - Aquaculture I
ZO 588 - Neurobiology
ZO 714 - Advanced Cell Biology
ZO 718 - Community Ecology
ZO 740 - Evolutionary Genetics
ZO 756 - Ecology of Fishes
ZO 760 - Principles of Ecology
ZO 791 - Topics in Animal Behavior