

MAS Elective Courses

- **At least 17 credits required. Any elective courses selected must differ from those taken to fulfill core course requirements.**
- **Only 6 credit hours of 400 level courses are allowed. Cross-listed Animal Science 400 level courses are not allowed.**
- **Piggybacked 400 level courses that are taken as an undergraduate cannot be taken as a 500 level course.**
- **Additional elective courses not on the general elective course list may be included in a MAS degree plan of work with mentor's permission and DGP approval.**
- **900 level Vet School courses are not considered graduate courses and will not count towards a MS, MAS or PhD degree. MS or MAS students who get accepted to Vet School before they receive their Masters will not be able to transfer 900 level courses from the Vet Curriculum into their Graduate Plan of Work. There will be no exceptions to this rule.**

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 524 – Coordinating the High School Agricultural Education Program

[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 533 – Leadership and Management of Volunteers 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 561](#) - Equine Nutrition
- [ANS 571](#) - Regulation of Metabolism
- [ANS 575](#) - Current Topics in Genomics and Proteomics in Animal Science
- [ANS 601](#) – Animal Science Seminar
- [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 726](#) – Advanced Topics in Quantative 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 404](#) – Advanced Agribusiness Management
- [ARE 412](#) – Advanced Agribusiness Marketing
- ARE 413 – Applied Agribusiness Marketing
- [ARE 433](#) - U.S. Agricultural Policy
- [ARE 436](#) - Environmental Economics

Biology

- [BIO 402](#) - Invertebrate Zoology
- BIO 405 - Functional Histology
- BIO 410 - Introduction to Animal Behavior
- BIO 413 - Cell Biology
- BIO 421 - Advanced Human Anatomy & Physiology Lab
- BIO 422 - Biological Clocks
- BIO 424 - Endocrinology
- BIO 425 - General Entomology

[BIO 430](#) - Fisheries and Wildlife Administration
BIO 460 – Field Ecology and Methods
BIO 434 – Hormones and Behavior
BIO 449 - Principles of Biological Oceanography
BIO 488 - Neurobiology

Biological and Agricultural Engineering

[BAE 435](#) - Precision Agriculture Technology
[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 572](#) - Irrigation and Drainage
BAE 573 - Introduction to Surface Hydrologic/Water Quality Modeling
[BAE 576](#) - Watershed Monitoring and Assessment
[BAE 578](#) - Agricultural Waste Management
BAE 771- Theory of Drainage – Saturated Flow
[BAE 785](#) - Food Rheology

Business Administration

[MBA 514](#) - Technology, Law, and the Internet
MBA 515 – Enterprise Systems
MBA 520 – Managerial Finance
[MBA 554](#) - Project Management
[MBA 570](#) - Managing the Growth Venture
[MBA 576](#) - Technology Evaluation and Commercialization Concepts
[MBA 577](#) - Technology Evaluation and Strategy
MBA 580 - Global Strategy
MBA 585 - Current Topics in BioSciences Management
MBA 586 - Legal and Marketing Dynamics in Pharmaceutical and Biotechnology

Business Management

BUS 590 – Special Topics in Business Management

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](#) – Biological Scanning Electron Microscopy
[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 462](#) - Gene Expression Analysis: Microarrays
[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 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 754](#) - Principles Of Analytical Epidemiology
[CBS 755](#) - Immunoparasitology
[CBS 760](#) - Molecular Technologies for Epidemiologic Investigation
[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

Crop Science

- [CS 411](#) - Crop Ecology
- [CS 414](#) - Weed Science
- [CS 415](#) - Integrated Pest Management
- [CS 430](#) - Advanced Agroecology
- [CS 462](#) - Soil-Crop Management Systems
- [CS 717](#) - Weed Management Systems

Economics

- [EC 404](#) - Money, Financial Markets, and the Economy
- [EC 410](#) - Public Finance
- [EC 413](#) - Competition, Monopoly and Public Policy
- [EC 431](#) - Labor Economics
- [EC 436](#) - Environmental Economics
- [EC 437](#) - Health Economics
- [EC 448](#) - International Trade
- [EC 449](#) - International Finance
- [EC 451](#) - Introduction to Econometrics
- [EC 471](#) - Evolution of the American Economy
- [EC 474](#) - Economics of Financial Institutions and Markets

Economics-Graduate

- [ECG 505](#) - Applied Microeconomic Analysis
- [ECG 506](#) - Applied Macroeconomic Analysis
- [ECG 512](#) - Law and Economics
- [ECG 515](#) - Environmental and Resource Policy
- [ECG 537](#) - Health Economics
- [ECG 540](#) - Economic Development
- [ECG 700](#) - Fundamentals of Microeconomics
- [ECG 703](#) - Fundamentals of Macroeconomics
- [ECG 706](#) - Industrial Organization
- [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 503](#) - Insect Morphology and Physiology
- [ENT 550](#) - Fundamentals of Arthropod Management
- [ENT 582](#) - Medical and Veterinary Entomology
- [ENT 726](#) - Biological Control of Insects and Weeds

[ENT 762](#) - Insect Pest Management In Agricultural Crops

Food Science

[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 725](#) - Fermentation Microbiology
[FS 730](#) - Human Nutrition

Fisheries and Wildlife Sciences

[FW 453](#) - Principles of Wildlife Science
[FW 515](#) - Fish Physiology
[FW 553](#) - Principles of Wildlife Science
[FW 560](#) - International Wildlife Management and Conservation
[FW 586](#) - Aquaculture I

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 761](#) - Advanced Molecular Biology of the Cell
[GN 768](#) - Nucleic Acids: Structure and Function

Immunology

[IMM 705](#) - Immunotoxicology
[IMM 751](#) - Immunology
[IMM 755](#) - Immunoparasitology
[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 751](#) - Immunology
[MB 758](#) - Prokaryotic Molecular Genetics
[MB 771](#) - Molecular Virology of Animal Viruses
[MB 783](#) - Advanced Immunology

Nutrition

[NTR 420](#) - Community Nutrition
[NTR 500](#) - Principles of Human Nutrition
[NTR 550](#) - Applied Ruminant Nutrition
[NTR 554](#) - Lactation, Milk, and Nutrition
[NTR 555](#) - Exercise Nutrition
[NTR 701](#) - Protein and Amino Acid Metabolism
[NTR 706](#) - Vitamin Metabolism
[NTR 708](#) - Energy Metabolism
[NTR 730](#) - Human Nutrition
[NTR 764](#) - Advances in Gastrointestinal Pathophysiology
[NTR 775](#) - Mineral Metabolism
[NTR 785](#) - Digestion and Metabolism in Ruminants

Philosophy

[PHI 420](#) - Global Justice
[PHI 425](#) - Introduction to Cognitive Science
[PHI 440](#) - The Scientific Method

[PHI 475](#) - Ethical Theory
[PHI 520](#) - Global Justice
[PHI 540](#) - The Scientific Method
[PHI 545](#) - Philosophy of Biology
[PHI 575](#) - Ethical Theory
[PHI 816](#) - Introduction to Research Ethics

Physiology

[PHY 503](#) - General Physiology I
[PHY 504](#) - General Physiology II
[PHY 524](#) - Comparative Endocrinology
[PHY 552](#) - Advanced Reproductive Physiology & Biotechnology
[PHY 702](#) - Reproductive Physiology of Mammals
[PHY 764](#) - Advances in Gastrointestinal Pathophysiology
[PHY 780](#) - Mammalian Endocrinology

Poultry Science

[PO 410](#) - Production and Management of Game Birds in Confinement
[PO 421](#) - Commercial Egg Production
[PO 422](#) - Incubation and Hatchery Management
[PO 424](#) - Poultry Meat Production
[PO 435](#) - Poultry Incubation & Breeding
[PO 524](#) - Comparative Endocrinology
[PO 566](#) - Animal Cell Culture Techniques
[PO 757](#) - Comparative Immunology
[PO 775](#) - Mineral Metabolism

Plant Pathology

[PP 530](#) - Agriculture, Ethics and the Environment

Soil Science

[SSC 440](#) - Geographic Information Systems (GIS) in Soil Science & Agriculture
[SSC 452](#) - Soil Classification
[SSC 461](#) - Soil Physical Properties and Plant Growth
[SSC 462](#) - Soil-Crop Management Systems
[SSC 470](#) - Wetland Soils
[SSC 532](#) - Soil Microbiology
[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

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 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 701](#) – Fundamentals of Toxicology
- [TOX 704](#) - Chemical Risk Assessment
- [TOX 705](#) - Immunotoxicology
- [TOX 710](#) – Molecular and Biochemical Toxicology
- [TOX 715](#) - Environmental Toxicology
- [TOX 727](#) - Pesticide Behavior and Fate in the Environment
- [TOX 771](#) - Cancer Biology

Zoology

- [ZO 503](#) - General Physiology I
- [ZO 504](#) - General Physiology II
- [ZO 512](#) - Animal Symbiosis
- [ZO 513](#) - Comparative 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 588](#) - Neurobiology
- [ZO 718](#) - Community Ecology
- [ZO 756](#) - Ecology of Fishes
- [ZO 791](#) - Topics in Animal Behavior