

DAIRY SCIENCE (DY SCI)

DY SCI 1 – COOPERATIVE EDUCATION/CO-OP IN DAIRY SCIENCE

1 credit.

Full-time off-campus work experience which combines classroom theory with practical knowledge of operations to provide a background upon which to base a professional career. Students receive credit only for the term in which they are actively enrolled and working. The same work experience may not count toward credit in another course.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Fall 2018

DY SCI/AN SCI 101 – INTRODUCTION TO ANIMAL SCIENCES

3 credits.

An overview of animal sciences covering anatomy, physiology, nutrition, reproduction, genetics, management, animal welfare, and behavior of domesticated animals. Food animals are emphasized to discuss their contributions to humans.

Requisites: None

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Elementary

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2023

DY SCI/AN SCI 102 – INTRODUCTION TO ANIMAL SCIENCES LABORATORY

1 credit.

Hands-on experience and demonstrations to develop practical skills with animals and to better understand the application of science to food production animals. It covers anatomy, physiology, nutrition, reproduction, genetics, management, animal welfare, and behavior of domesticated animals.

Requisites: DY SCI/AN SCI 101 or concurrent enrollment

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Elementary

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2023

DY SCI 205 – DAIRY CATTLE IMPROVEMENT PROGRAMS

2 credits.

Dairy cattle evaluation and selection, including: linear type appraisal, dairy cattle judging, mating programs, breed comparisons, cattle marketing, and national genetic improvement programs.

Requisites: DY SCI/AN SCI 101

Repeatable for Credit: No

Last Taught: Spring 2023

Learning Outcomes: 1. Demonstrate knowledge about the organizations that play major roles in the US dairy cattle genetics industry. Audience: Undergraduate

2. Apply dairy cattle appraisal systems for evaluating functional conformation. Audience: Undergraduate

3. Use dairy management scorecards that contribute to animal welfare and productivity. Audience: Undergraduate

4. Identify characteristics associated with the North American dairy breeds and analyze their genetic progress. Audience: Undergraduate

5. Recognize factors that influence dairy cattle values for merchandising and herd management purposes. Audience: Undergraduate

6. Integrate herd level genetic improvement strategies, including corrective mating systems, to foster genetic progress and achieve producer goals. Audience: Undergraduate

DY SCI 233 – DAIRY HERD MANAGEMENT I

3 credits.

Overview of practical dairy herd management with components of reproduction, nutrition, milk quality, raising dairy replacements, facilities and records. Laboratories emphasize practical applications, analyses of alternatives and decision making.

Requisites: DY SCI/AN SCI 101

Repeatable for Credit: No

Last Taught: Fall 2023

Learning Outcomes: 1. Apply dairy management terms and systems to real-world situations. Audience: Undergraduate

2. Evaluate farm management practices using dairy industry benchmarks. Audience: Undergraduate

3. Identify, formulate and solve dairy management related problems using appropriate information and approaches. Audience: Undergraduate

4. Assess effective dairy herd management using dairy records. Audience: Undergraduate

5. Work productively in teams to provide constructive input and leadership on dairy management related problems. Audience: Undergraduate

6. Communicate effectively through written reports, oral presentations and discussions. Audience: Undergraduate

DY SCI 234 – DAIRY HERD MANAGEMENT II

3 credits.

The second of a two course sequence designed as an overview of practical dairy herd management with components of animal welfare and handling, health, calf and heifer rearing, facilities and production economics. Laboratories emphasize practical applications, investigation of alternatives and decision making.

Requisites: DY SCI 233

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Apply dairy management terms and systems to real-world situations. Audience: Undergraduate

2. Evaluate farm management practices using dairy industry benchmarks. Audience: Undergraduate

3. Identify, formulate and solve dairy management related problems using appropriate information and approaches. Audience: Undergraduate

4. Assess effective dairy herd management using dairy records. Audience: Undergraduate

5. Work productively in teams to provide constructive input and leadership on dairy management related problems. Audience: Undergraduate

6. Communicate effectively through written reports, oral presentations and discussions. Audience: Undergraduate

DY SCI 289 – HONORS INDEPENDENT STUDY

1-2 credits.

Honors research work under direct guidance of a faculty member in an area of Dairy Science. Students are responsible for arranging the work and credits with the supervising instructor.

Requisites: Consent of instructor

Course Designation: Honors - Honors Only Courses (H)

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 1998

Learning Outcomes: 1. Demonstrate content knowledge and skills as signified in an honors project or scholarly honors work. Audience: Undergraduate

2. articulate their honors experience to peers Audience: Undergraduate

3. apply perspectives to composed work through engagement in academic experiences Audience: Undergraduate

DY SCI 299 – INDEPENDENT STUDY

1-3 credits.

Individual introductory to intermediate work under direct guidance of a faculty member in an area of Dairy Science. Students are responsible for arranging the work and credits with the supervising instructor.

Requisites: Consent of instructor

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

Learning Outcomes: 1. Summarize intellectual growth associated with independent study work through mentor discussion Audience: Undergraduate

2. Identify diversity of viewpoints through critical thinking. Audience: Undergraduate

3. Illustrate growth in reading, writing, and communication skills Audience: Undergraduate

DY SCI/AN SCI/NUTR SCI 311 – COMPARATIVE ANIMAL NUTRITION

3 credits.

Nutrients and their assimilation, function, and interactions that affect metabolism in mammals. Differences among species will be used to emphasize unique digestive and physiological functions and how these differences affect metabolism of nutrients. Humans will be used in some comparisons. Follows physiological progression of nutrients, starting with an overview of the digestive tract followed by water and builds on specific roles of nutrients and substrates needed to provide basic processes required for maintenance, tissue accretion, and homeostatic regulation of nutrients.

Requisites: CHEM 341, 343, (BIOCHEM 301 or concurrent enrollment), or (BIOCHEM 501 or concurrent enrollment)

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2024

DY SCI/AN SCI 320 – ANIMAL HEALTH AND DISEASE

3 credits.

Provides an introduction to and exploration of the interconnectivity between factors that affect health and disease and the central role of the immune system using infectious disease in animals as a key focus. Explores principal causes and identification of animal diseases, common diseases of farm animals, zoonoses and public health, disease prevention and management including biosecurity measures and host immune responses. Fosters appreciation for the translatability and universality of knowledge between human and animal health and disease.

Requisites: ZOOLOGY/BIOLOGY/BOTANY 151, (ZOOLOGY/BIOLOGY 101 and 102), BIOCORE 383, or graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

DY SCI/AN SCI 361 – INTRODUCTION TO ANIMAL AND VETERINARY GENETICS

2 credits.

The molecular basis for inheritance of monogenic and polygenic traits related to animal disease and production. An introduction to the principles of improving animal health and performance by selection and mating systems in companion animals, horses, livestock, and poultry.

Requisites: ZOOLOGY/BIOLOGY/BOTANY 151, (ZOOLOGY/BIOLOGY 101 and 102), or (BIOCORE 382, 383, and 384) or graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

DY SCI/AN SCI 362 – VETERINARY GENETICS

2 credits.

The genetic basis for predisposition to disease or resistance to disease in livestock and companion animal species. Genetic defects, their discovery, diagnosis and treatment.

Requisites: DY SCI/AN SCI 361

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

DY SCI/AN SCI 363 – PRINCIPLES OF ANIMAL BREEDING

2 credits.

Application of the principles of quantitative genetics to the improvement of livestock and poultry; breeding value estimation and selection techniques; effects of inbreeding and hybrid vigor; crossbreeding systems.

Requisites: DY SCI/AN SCI 361

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

DY SCI/AN SCI 370 – LIVESTOCK PRODUCTION AND HEALTH IN AGRICULTURAL DEVELOPMENT

3 credits.

Physical, biological and social nature of animal agriculture systems and their improvement in developing countries; analysis of the state of livestock research and development in the developing countries and the world role of U.S. animal agriculture.

Requisites: DY SCI/AN SCI 101, ZOOLOGY/BIOLOGY/BOTANY 151, ZOOLOGY/BIOLOGY 101, or (BIOCORE 381 and 382), or graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

Learning Outcomes: 1. Describe the physical, biological and social nature of animal agriculture and its improvement in developing countries. Audience: Both Grad Undergrad

2. Analyze the constraints to improving livestock production on resource poor farms in developing countries. Audience: Both Grad Undergrad

3. Demonstrate knowledge about institutional infrastructures involved in research, education, and development projects in animal agriculture. Audience: Both Grad Undergrad

4. Develop skills needed to analyze and project strategies for improvement of a production system in a developing country. Audience: Graduate

DY SCI/AGROECOL/AGRONOMY 371 – MANAGED GRAZING FIELD STUDY

1-2 credits.

For those interested in developing a comprehensive understanding of the principles, practices, and conservation potential of managed grazing systems, and how these farming systems may contribute to the sustainability and diverse tapestry of Wisconsin's working landscape. Visit managed grazing systems of successful grazing-based farmers (graziers) across southern/central counties in Wisconsin, and/or research sites at UW's Arlington and/or Lancaster Research Stations and/or the Discovery Farms Program. An opportunity to discuss at length with farm managers and researchers the practices in place at each farm and research site. Includes introduction to UWEX pasture forage/nutrient management planning and budgeting software.

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2017

DY SCI/AN SCI 373 – ANIMAL PHYSIOLOGY

3 credits.

Covers physiological processes that regulate the body and the anatomy and function of different physiological systems. Includes interactions between organ systems, analysis of a single organ system from the molecular to the organismal, and comparisons and contrasts of organ systems among different domestic animal species.

Requisites: ZOOLOGY/BIOLOGY/BOTANY 151, (ZOOLOGY/BIOLOGY 101 and 102), or BIOCORE 383

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Integrate the physiological processes that regulate the body of different animal species (largely domestic animals and humans) Audience: Undergraduate

2. Synthesize the regulation of an organ system from the molecular level all the way to the whole animal level and apply knowledge of a physiological mechanism to explain how a whole animal physiological process occurs Audience: Undergraduate

3. Integrate interactions between different organ systems (homeostasis) and explain the anatomy of different physiological systems and their specific functions Audience: Undergraduate

4. Determine how changes in internal or external environment will alter physiologic processes to deal with these changes Audience: Undergraduate

5. Determine how changes in one physiological system may impact a different physiological system Audience: Undergraduate

6. Describe similarities and differences in physiologic systems between animal species (with emphasis on domestic animals and humans) Audience: Undergraduate

DY SCI 375 – SPECIAL TOPICS

1-4 credits.

Various topics in Dairy Science of current interest to undergraduate students.

Requisites: None

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

Learning Outcomes: 1. Explain concepts and processes related to specific topics in Dairy Science Audience: Undergraduate

2. Integrate and apply knowledge to understand issues associated with in Dairy industry Audience: Undergraduate

3. Synthesize scientific literature to develop critical thinking skills Audience: Undergraduate

DY SCI 378 – LACTATION PHYSIOLOGY

3 credits.

Focuses on lactation physiology across mammalian species. Structure and function of mammary glands; hormonal control of mammary development and lactation; cellular mechanisms of milk synthesis; the chemistry of milk synthesis; mastitis and other abnormalities of mammary functions.

Requisites: (BIOCHEM 301, 501, BMOLCHEM 314, or concurrent enrollment) and (ZOOLOGY/BIOLOGY 101 and 102), ZOOLOGY/BIOLOGY/BOTANY 151, or (BIOCORE 382, 383, and 384), or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

Learning Outcomes: 1. Assemble an understanding of the origin of the mammary gland Audience: Undergraduate

2. Explain mammary gland anatomy and physiology Audience: Undergraduate

3. Distinguish mammary gland development in mammalian species (in utero all the way through the lactation cycle) Audience: Undergraduate

4. Explain the mechanisms governing mammalian milk synthesis and secretion Audience: Undergraduate

5. Articulate the role the mammalian endocrine system plays in governing lactation and mammary gland development Audience: Undergraduate

6. Assess mammalian mammary gland control at the local level (autocrine/paracrine mechanisms) Audience: Undergraduate

7. Discriminate components that comprise mammalian milk and their functions for the neonate Audience: Undergraduate

8. Assess the diseases that affect the mammalian mammary gland (i.e., mastitis, breast cancer, etc.) and how they may impact mammary gland growth and development Audience: Undergraduate

9. Integrate the process of human lactation with the associated physiological and social components that may impact breastfeeding Audience: Undergraduate

DY SCI 399 – COORDINATIVE INTERNSHIP/COOPERATIVE EDUCATION

1-8 credits.

An internship under guidance of a faculty or instructional academic staff member in Animal and Dairy Sciences and internship site supervisor. Students are responsible for arranging the work and credits with the faculty or instructional academic staff member and the internship site supervisor.

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Workplace - Workplace Experience Course

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

Learning Outcomes: 1. Establish a network of mentors to support academic and professional growth Audience: Undergraduate

2. Develop and illustrate specialized skills relevant to the focus of study associated with internship program Audience: Undergraduate

3. Differentiate a diversity of disciplinary approaches and viewpoints in the agriculture industry Audience: Undergraduate

DY SCI 400 – STUDY ABROAD IN DAIRY SCIENCE

1-6 credits.

Provides an area equivalency for courses taken on Madison Study Abroad Programs that do not equate to existing UW courses.

Requisites: None

Repeatable for Credit: Yes, unlimited number of completions

DY SCI/AN SCI 414 – RUMINANT NUTRITION & METABOLISM

3 credits.

Integrates nutritional and biochemical concepts to understand digestive and metabolic processes in dairy and beef cattle, which are then quantitatively represented to predict and manipulate production and health outcomes.

Requisites: DY SCI/AN SCI/NUTR SCI 311, (BIOCHEM 301 or 501) or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

Learning Outcomes: 1. Integrate nutritional and biochemical concepts to understand digestion and metabolism of nutrients. Audience: Both Grad Undergrad

2. Predict quantitative metabolic and production outcomes in ruminants. Audience: Both Grad Undergrad

3. Determine the role of metabolism in feed efficiency, animal production and health, and environmental load of ruminant production systems. Audience: Both Grad Undergrad

4. Investigate, interpret, summarize, and debate findings from scientific literature in order to develop and communicate recommendations for ruminant diets to identified audiences. Audience: Both Grad Undergrad

5. Apply research models to experimental and production data to predict metabolic outcomes Audience: Graduate

DY SCI/AN SCI 434 – REPRODUCTIVE PHYSIOLOGY

3 credits.

Principles of reproductive physiology, improvement of fertility, and artificial insemination.

Requisites: ZOOLOGY/BIOLOGY/BOTANY 152, (ZOOLOGY/BIOLOGY 101 and 102) or (BIOCORE 382, 383, and 384) or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

DY SCI/AGRONOMY 471 – FOOD PRODUCTION SYSTEMS AND SUSTAINABILITY

3 credits.

Delves into aspects of natural sciences (biology and agricultural sciences) and social sciences underpinning the assessment of food production systems as related to a variety of outcomes including but not restricted to human and environmental health, air and water quality, greenhouse gases emission, land use, economic opportunity, social justice, as well as mitigation and adaptation to climate change, locally, regionally, domestically, across continents, and globally.

Requisites: (Graduate/professional standing) or junior standing and satisfied Quantitative Reasoning (QR) B requirement

Course Designation: Breadth – Either Biological Science or Social Science

Level – Advanced

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Explain the social, economic, and/or environmental dimension of sustainability challenges associated with food production systems. Audience: Both Grad Undergrad

2. Evaluate food production systems for their contribution to, mitigation potential of, and adaptation to climate change. Audience: Both Grad Undergrad

3. Identify ways in which social structures profoundly affect not only people, but also biology, ecology, and our very climate. And the complement: how people's race/class/gender/occupation/nation status within the global social structure, as well as the nature of the global social structure itself, profoundly impacts their ability to cope with changing climate. Audience: Both Grad Undergrad

4. Critically evaluate the scientific literature and other sources of information related to the sustainability of food systems. Audience: Both Grad Undergrad

5. Analyze the causes of and solutions for the sustainability of food production, distribution, marketing, consumption, and waste disposal. Audience: Both Grad Undergrad

6. Develop analytical and problem-solving skills individually and in teams of classmates with diverse worldviews. Audience: Both Grad Undergrad

7. Communicate effectively information to multiple audiences through multiple medias Audience: Both Grad Undergrad

8. Develop an aptitude for working with mixed teams including undergraduate students Audience: Graduate

9. Demonstrate research and writing skills to produce academically rigorous literature reviews Audience: Graduate

DY SCI/AN SCI/FOOD SCI/SOIL SCI 472 – ANIMAL AGRICULTURE AND GLOBAL SUSTAINABLE DEVELOPMENT

1 credit.

Examines issues related to global agriculture and healthy sustainable development. Using a regional approach and focusing on crops and livestock case studies, students will learn the interdependence between US agriculture and agriculture in emerging economies. Some topics covered include population and food, immigration, the environment; crop and livestock agriculture; global trade; sustainability; food security, the role of women in agriculture, and the role of dairy products in a healthy diet.

Requisites: None**Repeatable for Credit:** No**Last Taught:** Spring 2024

Learning Outcomes: 1. Apply sustainability principles and/or framework to addressing the challenge of feeding an increasing world population sustainably. Audience: Undergraduate

2. Define and characterize sustainability, sustainable agriculture and Sustainable Development Audience: Undergraduate

3. Analyze the contributions of animal agriculture to the Sustainable Development Goals both in developing and developed countries. Audience: Undergraduate

4. Explain the social, economic, and/or environmental dimensions of the sustainability challenges of diverse animal agricultural systems both in developing and developed countries. Audience: Undergraduate

5. Evaluate the role of livestock in communities where poverty, hunger and marginalization are embedded as a way of life. Audience: Undergraduate

6. Critically evaluate the causes of –and ways to break– the chains of hunger and poverty among the poorest of the poor. Audience: Undergraduate

DY SCI/AN SCI/FOOD SCI/SOIL SCI 473 – INTERNATIONAL FIELD STUDY IN ANIMAL AGRICULTURE AND SUSTAINABLE DEVELOPMENT

2 credits.

Examines issues related to global agriculture and healthy sustainable development. Using a regional approach and focusing on crops and livestock case studies, students will learn the interdependence between US agriculture and agriculture in emerging economies. Some topics covered include population and food, immigration, the environment; crop and livestock agriculture; global trade; sustainability; and the role of women in agriculture and the role of dairy products in a healthy diet.

Requisites: DY SCI/AN SCI/FOOD SCI/SOIL SCI 472**Repeatable for Credit:** No

Learning Outcomes: 1. Improve communication and interpersonal skills associated with participating in team-based intercultural experiences Audience: Undergraduate

2. Be better prepared for professional success in an interconnected world by navigating unfamiliar cultural norms and societal differences Audience: Undergraduate

3. Reflect on US-centric personal and cultural values while building an appreciation and respect for the Latin America culture. Audience: Undergraduate

4. Explain the social, economic, and/or environmental dimensions of the sustainability challenge of alleviating poverty and malnutrition in Mexico Audience: Undergraduate

5. Apply sustainability principles and/or framework to addressing the challenge of fostering prosperity in marginalized indigenous communities Audience: Undergraduate

6. Analyze both from their own disciplinary lens and from an interdisciplinary lens the contributions of dairy farming to the Sustainable Development Goals Audience: Undergraduate

7. Evaluate the sustainability of subsistence, market-oriented, and industrial-scale farming systems Audience: Undergraduate

DY SCI 534 – REPRODUCTIVE MANAGEMENT OF DAIRY CATTLE

3 credits.

Provides the technical knowledge and practical skills to design and execute an effective reproductive management program for dairy cattle. Study key reproductive physiology and practical research results that underlie reproductive management programs. Participate in hands-on laboratories to learn, practice, and demonstrate practical reproductive management techniques including: semen handling, artificial insemination, and ultrasound of ovaries and uterus.

Requisites: DY SCI/AN SCI 434**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2024

Learning Outcomes: 1. Identify female reproductive tract structures, reproductive hormones, and know the changes during the estrous cycle Audience: Both Grad Undergrad

2. Design a reproductive management program for cows or heifers Audience: Both Grad Undergrad

3. Identify use of different pregnancy diagnosis procedures in a reproductive management program Audience: Both Grad Undergrad

4. Evaluate reproductive efficiency in dairy farms. Design new reproductive management programs based on evaluation of farm data Audience: Both Grad Undergrad

5. Design and execute a superovulation program Audience: Both Grad Undergrad

6. Describe process used for artificial insemination of dairy cattle Audience: Both Grad Undergrad

7. Describe and interpret an ultrasound of the ovaries and uterus of dairy cattle. Audience: Graduate

8. Complete a research project using ultrasound Audience: Graduate

DY SCI 535 – DAIRY FARM MANAGEMENT PRACTICUM

3 credits.

Principles of nutrition, breeding, reproduction, and management at the farm level are integrated. Develop skills in decision making, information gathering, problem solving, and interpersonal communication through field trips to working commercial dairy operations.

Requisites: DY SCI 234 or GRAD**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Fall 2023

Learning Outcomes: 1. Identify, formulate and solve problems using appropriate information and approaches Audience: Both Grad Undergrad

2. Communicate effectively through written reports, oral presentations and discussions Audience: Both Grad Undergrad

3. Work effectively in teams to provide constructive input and leadership on dairy management related problems Audience: Both Grad Undergrad

4. Evaluate farm management and performance using dairy industry benchmarks Audience: Both Grad Undergrad

5. Demonstrate an understanding of business concepts and thinking Audience: Both Grad Undergrad

6. Synthesize knowledge and apply peer reviewed research to solve dairy management problems Audience: Graduate

DY SCI 681 – SENIOR HONORS THESIS

2-4 credits.

Individual study for majors completing theses for Honors degrees as arranged with a faculty member.

Requisites: Consent of instructor**Course Designation:** Honors - Honors Only Courses (H)**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Fall 2022**DY SCI 682 – SENIOR HONORS THESIS**

2-4 credits.

Second semester of individual study for majors completing theses for Honors degrees as arranged with a faculty member.

Requisites: Consent of instructor**Course Designation:** Honors - Honors Only Courses (H)**Repeatable for Credit:** No**Last Taught:** Spring 2023

DY SCI 699 – SPECIAL PROBLEMS

1-3 credits.

Individual advanced work in an area of Dairy Sciences under the direct guidance of a faculty member.

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

DY SCI 799 – PRACTICUM IN DAIRY SCIENCE TEACHING

1-3 credits.

Instructional orientation to teaching at the higher education level in the agricultural and life sciences, direct teaching experience under faculty supervision, experience in testing and evaluation of students, and the analysis of teaching performance.

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Articulate learning goals of the practicum separately from the main educational goals of the course in which the practicum takes place. Audience: Graduate

2. Gain experience in creating, revising, critiquing course syllabi, that is, get firsthand experience in developing course requirements and policies Audience: Graduate

3. Develop a strategy process to align course materials and course assignments with course objectives. Audience: Graduate

4. Practice teaching under distinct instructional modalities; lecture vs discussion vs labs; synchronous vs asynchronous remote instruction Audience: Graduate

5. Prepare and implement lesson plans of a class period, a week of instruction, or a module of the class Audience: Graduate

6. Acquire classroom management skills including how to deliver content, lead a discussion, handle questions and answers Audience: Graduate

7. Develop both formative and summative evaluation instruments to gain feedback on how to assess and improve the teaching and learning process Audience: Graduate

DY SCI/AN SCI 824 – RUMINANT NUTRITIONAL PHYSIOLOGY I

4 credits.

Focuses on rumen microbiology, metabolite modeling, as well as protein and VFA nutrition and metabolism.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2022

Learning Outcomes: 1. Assess source, digestion, absorption, utilization, and metabolism of nutrients in ruminants Audience: Graduate

2. Integrate concepts of carbon and nitrogen tracing and flux through ruminant body systems Audience: Graduate

3. Develop a command of modeling nutrient flux through tissues and be able to apply and extrapolate concepts to nutrient utilization and tracing methodology Audience: Graduate

4. Clearly communicate the conceptual basis, assumptions, and limitations of techniques and methodology necessary to quantify digestive and metabolic processes Audience: Graduate

5. Evaluate nutritional recommendations and current topics in ruminant nutrition Audience: Graduate

DY SCI/AN SCI 825 – RUMINANT NUTRITIONAL PHYSIOLOGY II

4 credits.

Focuses on calf and heifer nutrition, regulation of dry matter intake, plant and forage chemistry, vitamins, lipids, and starch.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

Learning Outcomes: 1. Assess source, digestion, absorption, utilization, and metabolism of nutrients in ruminants Audience: Graduate

2. Integrate concepts of carbon and nitrogen tracing and flux through ruminant body systems Audience: Graduate

3. Develop a command of modeling nutrient flux through tissues and be able to apply and extrapolate concepts to nutrient utilization and tracing methodology Audience: Graduate

4. Clearly communicate the conceptual basis, assumptions, and limitations of techniques and methodology necessary to quantify digestive and metabolic processes Audience: Graduate

5. Evaluate nutritional recommendations and current topics in ruminant nutrition Audience: Graduate

DY SCI 875 – SPECIAL TOPICS

1-4 credits.

Specialized subject matter of current interest to graduate students.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

Learning Outcomes: 1. Analyze and critique research results, interpretations and proposals Audience: Graduate

2. Articulate critical thinking and knowledge about the significance of current research in the fields of animal and dairy science by presenting and/or critiquing scientific presentations Audience: Graduate

DY SCI 900 – SEMINAR

1 credit.

Comprehensive reviews of research aimed at broadening understanding of dairy science.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

Learning Outcomes: 1. Analyze and critique research results, interpretations and proposals Audience: Graduate

2. Articulate critical thinking and knowledge about the significance of current research in the fields of animal and dairy science by presenting and/or critiquing scientific presentations Audience: Graduate

DY SCI/AN SCI 931 – SEMINAR IN ANIMAL NUTRITION

1 credit.

Discussion of literature that has a bearing on animal nutrition. Students are to survey the literature and present a seminar.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

DY SCI/AN SCI/GENETICS 951 – SEMINAR IN ANIMAL BREEDING

0-1 credits.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2020

DY SCI 990 – RESEARCH

1-12 credits.

Independent research in preparation of a graduate thesis under supervision of a faculty member.

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024