

Department of Animal Sciences

GRADUATE COURSE DESCRIPTIONS

36571 Population Genetics 3 Cr. Principles of population genetics, non random mating, mutation, selection, gene frequencies in small population, genotypic value, selection response, breeding value, dominance deviation, inbreeding and changes in genotypic frequencies.

36574 Quantitative Genetics 3 Cr. Quantitative traits, genetic parameters, estimating genetic variances, selection index procedure, prediction of transmitting ability, prediction of additive genetic value, genetic evaluation with different source of records, genetic, environmental and phenotypic correlation.

36575 Advanced Animal Breeding I 3 Cr. Mating system, selection intensity factor, optimizing genetic progress, negative selection, selection for small value, measuring genetic gain, equations for genetic gain, expected change in other traits, total economic value, correlated response, approximate procedure for predicting total genetic value.

36576 Advanced Animal Breeding II 3 Cr. Principle of Linear Models and analysis of variance, prediction and estimation. Mixed models. Models applications in animal breeding (Relationship matrix, Prediction Error, Maternal Effects, Genetic Groups, Multiple Traits, Random Regression, Genetic Variance across generations, Variance components estimation, Maximum Likelihood, Bayesian methods)

36584 Applied Statistics in Animal Science 3 Cr. Application of statistics in animal science experiments, methods of analysis of variance in fixed, random and mixed models, correlation and regression, least-squares procedures in analysis of variance (equal and unequal subclass), experimental design in animal science, hierarchial design.

36589 Special English 3 Cr. Reading and translating different topics related to animal sciences.

36570 Advanced Biochemistry 3 Cr. Chemical structures of proteins, CHO, lipids, enzymes, vitamins, and minerals. Photosynthesis, bioenergetic, metabolism of CHO, protein and lipids, protein and lipid synthesis, hormones and protein, CHO, and lipid degradations.

36578 Ruminant Nutrition 3 Cr. Rumen microbes, digestion, fermentation, metabolism, absorption, inhibitors, feed intake regulation, metabolic diseases and importance of ruminants.

Prerequisite: Advanced Animal Nutrition 36573

36573 Advanced Animal Nutrition 4 Cr. Gastrointestinal tract physiology, feedstuff evaluation, nutritional interrelationship, factors influencing feed intake and rate of passage, nutritional inhibitors in feed.

Prerequisite: Advanced Biochemistry 36570

36577 Poultry Nutrition 3 Cr. Digestion and absorption, nutrient utilization and interrelationships in poultry.

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Prerequisite: Advanced Biochemistry 36570

36572 Advanced Physiology 3 Cr. A study of mechanisms which interact to control physiology in farm animals. Physiology and biochemical effects and their interrelationships on digestion and metabolism in the farm animals.

36583 Physiology of Lactation 2 Cr. Physiology and biochemistry of lactation: (1) growth and development of the mammary gland, (2) Secretion of milk, and (3) ejaculation of the milk from the gland.

Prerequisite: Advanced Physiology 36572

36580 Advanced Reproductive Physiology 3 Cr. A study of mechanisms which interact to control reproduction in farm animals. Current scientific literature and hypotheses are presented and potential methods to enhance reproduction efficiency are examined. **Prerequisite:** Advanced Physiology 36572

36586 Laboratory Methodology in Animal Sciences 3 Cr. The application of spectrophotometry, chromatography, electrophoresis. and radioactive isotopes to research in animal sciences.

36581 Endocrinology 2 Cr. Lecture and discussion presentation of current concepts in endocrinology. Emphasis will be placed on the mechanisms which regulate and integrate the hypothalamic-hypophyseal-gonadal axis.

Prerequisite: Advanced Biochemistry 36570

36577 Poultry Nutrition 3 Cr. Nutritional research, nutrients requirements and factors affecting requirements, effects of different nutrients on growth, egg production, hatchability etc, interrelationships involving nutrients, metabolic and nutritional disease, due to malnutrition. Toxicant in feeds and their effects on poultry performance, feed additives, review of some papers regarding poultry nutrition.

Prerequisite: Advanced Animal Nutrition 36573

36811 Proteins & Amino Acids in Animal Nutrition 3 Cr. Utilization and metabolism of proteins and amino acids in animal; methods of providing amino acids for animal maintenance, growth and production; qualitative evaluation of proteins; analytical procedures for qualitative evaluation of proteins and amino acids.

36821 Vitamins in Animal Nutrition 3 Cr. Chemical and physiological role of vitamins in animal metabolism; interrelation of biochemical and physiological properties of vitamins in animal cell.

36812 Experimental Design in Animal Sciences 2 Cr. Implementation; suitable designs for livestock researches; designs for reducing experimental errors; analyzing the complicated and unequal data.

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36826 Metabolic Disorders 2 Cr. Nutritional disorders: ketosis, milk fever, grass tetany, fatty liver; digestive tract disorders: bloat, acidosis, nitrate and urea toxemia; acute lung edema; lung bloat; abomasum displacement; metabolic reactions to cold temperature (heart vessels, endocrine glands, growth hormone, ruminant infant, growth, lactation); nutritional diseases.

36820 Growth Physiology 2 Cr. Introduction; cells, muscle tissues and their growth mechanisms; fetal growth; comparative growth of tissues; hormonal control of growth; interrelationship between nutrition and growth; livestock products; review of recent literature.

36808 Enzymology 2 Cr. Introduction; classification; chemical structure and function of enzymes; kinetics and theory of enzyme action; separation and purification techniques; enzyme assays; review of recent literature.

Carbohydrates & Lipids in Animal Nutrition 3 Cr. Utilization and metabolism of carbohydrates and lipids in animal, systematic evaluation of biochemical properties of feed carbohydrates and lipids, and their effects, on absorption and metabolism of the ration nutrients.

Bioenergetics in Nutrition 3 Cr. Energy; classification of feed energy; efficiency and processing; increasing temperature and its relation to nutrition balance; warm-blooded animal; effect of temperature on biological functions and its efficiency; calorimetry and related techniques; nutritional balance and decreasing and increasing of feed efficiency; today and future bioenergetics.

Techniques & Methods of Nutrition Researches 4 Cr. Balancing the rations; livestock management; sampling procedures; balancing experiments; bioassays; trace methodology; estimating the nutritional requirements.

Digestive Physiology of Ruminants 2 Cr. Receptors of the digestive tract; movements of rumen and reticulum; blood circulation through omentum; functions of rumen and reticulum; rumen physiology and digestion.

Digestive Physiology of Nonruminants 2 Cr. Mastication and salivation; deglutition; muscles and nerves; hormones; gastric movements and secretion; secretion of duodenum, pancreas and bile; intestinal movements and absorption of water, electrolytes, carbohydrates, lipids, proteins and vitamins; gases.

Digestive Microbiology of Ruminants 2 Cr. Classification of bacteria in rumen; bacterial distribution in rumen; bacterial morphology; protozoa, their classification and morphology; transruminant movements and distribution of protozoa; microscopic tests and counting the protozoa; interrelationship between bacteria and protozoa; today and future microbiology.

Feed Processing 3 Cr. Effects of physical and chemical processing on feed carbohydrates, proteins and lipids; techniques of making mineral premixes and supplement blocks; vitamins and their premixes; protected proteins; additives (antioxidants, pigments, antibiotics, coccidiostats, etc.) and amino acids.

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Minerals in Animal Nutrition 3 Cr. Nutritional value of minerals; physical and chemical properties of minerals and their dynamic functions in live organisms.

Special Problems in Animal Nutrition 2 Cr.

Seminar 1 & 2 1 Cr. each.

Techniques & Methods in Meat Researches and Muscle Biology 3 Cr. Fundamental procedures and laboratory techniques in meat science; muscle histology; and muscle metabolism.

Animal Immunology 3 Cr. History; immunology; immunity and resistance of body against infection; classification and properties of antigens; antibodies and their biosynthesis; immunophysiology, different kinds of placenta and transfer of antibodies from mother to fetus; serological reactions; chemical properties and biological function of complementary agent; tolerance and hypersensitivity; self immunological diseases; effects of age and nutrition on prohibiting tumor growth.

Advanced Fish Nutrition 2 Cr. Fundamentals of fish metabolism; energy, protein and vitamin requirements; ration formulation for fish.

Laboratory Animals Nutrition 2 Cr. Introduction; digestive physiology of laboratory animals (mice, rats, guinea pigs, rabbits, fishes ...); digestion, absorption and metabolism of nutrients; special aspects of nutrition in laboratory animals; formulation and preparation of synthetic and applied rations for animals lab.

Animal Biotechnology 4 Cr. Description of the goals of technology for livestock improvement; application of technology for increasing the quality and quantity of livestock products, their reproductive efficiency and resistance to diseases; animal cell cycle; cell development, distinguishing, stress and repair; cell transfer, germ cells, development and growth, cell immunology and antigen technology; gene control in animal, gene treatment, ruminants microbiology and their ecological control; technology of animal reproduction; twinning; animal colonies; fertility control.

Rumen Physiology 3 Cr. Introduction (anatomy and physiology of rumen, microorganisms and their function); gastric development and growth in ruminants; digestive tract receptors; digestion in rumen; secretion and function of saliva; gastric movement; rumen disorders.

Laboratory Biochemistry 3 Cr. Review of the fundamental techniques of photometry and chromatography; radioisotopes, atomic absorption; separation, purification and microanalysis of carbohydrates, proteins, enzymes, lipids, nucleic acids and determination of their physical and chemical properties; metabolic reactions, chemicals and related experiments.

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Mycotoxicology 3 Cr. Mycotoxins and their relationship with agriculture; different kinds of mycotoxins in the food; estimating procedures for toxin, especially fungi; distribution, biological effect and control of toxins.

Toxicology of the Agricultural and Industrial Chemicals in the Environment 3 Cr. Discriminative techniques and procedures; synthetic chemicals in natural materials; toxins in livestock and poultry feeds; fate of the toxic chemicals in breeding dams; toxic residues in animal and crop products; controlling procedures of toxic allowances.

Toxicology 2 Cr. Definition; sampling; factors influencing the action mechanisms of arsenic, plumb, copper, selenium, fluorine, benzoic acid, nitrates and nitrites; volatile poisons (cyanides), sedatives and tranquillizers, alkaloids; poisonous plants (solanaceae) opium and derivatives; fern; ranunculaceae; cannula; brassica; hemlock; doping, oreganochlorine compounds, oregano phosphorous compounds; rodenticides; glucosides.