232. Dairy Production Laboratory
Fall, Spring. 1(0-2)
Physical characteristics of cows and facilities. Anatomy. Experience in estrus detection, milking equipment, feeding, foot care, health, and management of the pleasure horse.

242. Introduction to Horse Management
(A H 214.) Fall. 3(3-1)
The horse industry in today's society. Relationship of form to function. Selection, breeding, feeding, foot care, health, and management of the pleasure horse.

253. Livestock Production Laboratory
Fall, Spring. 1(0-2)
Species and classification of livestock. Feeds and rations. Determining market value. Managerial skills.

256. Meats, Poultry and Fishery Products
(A H 242.) Fall, 3(2-2) Interdepartmental with Biophysics and the Department of Physiology, Psychology, and Zoology.
Principles of evaluation and nutritive value. Identification of grades and cuts of beef, pork, lamb and poultry products.

257A. Meat Evaluation and Grading
(A H 245.) Winter. 1(0-3) ANS 217.
Students must not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.
Evaluation of beef, pork and lamb carcasses and wholesale cuts according to industry and consumer demands. Federal grading standards. Field trips to meat packing operations required.

257B. Meat Evaluation and Grading
(A H 245.) Fall. 1 to 3 credits. ANS 257A. Students must not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.
Evaluation of beef, pork and lamb carcasses and wholesale cuts according to industry and consumer demands. Federal grading standards. Field trips to meat packing operations required.

261. Introduction to Poultry Production
(P S 224.) Winter, Spring. 3(0-4)

262. Poultry Production Laboratory
Winter. Spring. 1(0-2)

313. Principles of Animal Nutrition
(325.) Spring. 5(5-0) PSL 241, CRM 132, BCH 200 recommended.

314. Principles of Animal Breeding
(461, 461I) Winter. 3(0-4) H S 211 or a course in Mendelian genetics.

337. Judging Dairy Cattle
(DRY 323.) Spring. 3(0-6) Students may not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.
Desired type in dairy cattle. Judging and showing procedures. Competitive judging. Teams selected to represent Michigan State University in national competition.

347A. Judging Horses
(A H 335.) Spring. 2(0-6) ANS 217.
Students must not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.
Evaluation of conformation. Productive and functional merits of individual horses. Field trips to prominent equine establishments and events required.

347B. Judging Horses
(A H 335) Fall. 1(0-6) ANS 347A. Students must not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.
Course is completed in the first half of the quarter. Evaluation of conformation. Productive and functional merits of individual horses. Field trips to prominent equine establishments and events required.

357A. Judging Livestock
(A H 335.) Winter. 1 to 3 credits. ANS 217 or approval of department. Students must not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.
Evaluation of conformation of cattle, pigs and sheep. Productive and functional merits of individual food animals. Field trips to prominent livestock establishments required.

357B. Judging Livestock
(A H 335.) Spring. 1 to 3 credits. ANS 357A. Students must not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.
Evaluation of conformation of cattle, pigs and sheep. Productive and functional merits of individual food animals. Field trips to prominent livestock establishments and to major livestock events required.

357C. Judging Livestock
(A H 335.) Fall. 1 to 3 credits. ANS 357B. Students must not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.
Evaluation of conformation of cattle, pigs and sheep. Productive and functional merits of individual food animals. Field trips to prominent livestock establishments and to major livestock events required.

400. Independent Study
(A H 415.) Fall, Winter, Spring, Summer. 1 to 4 credits. May receive a maximum of 10 credits. Approval of department.
Independent study in genetics, nutrition, physiology, technology, meat science, or management of poultry or livestock.

413. Toxicology of Food Producing Animals
(430.) Spring. 4(4-0) PSL 240, BCH 200.
Effect and effects of toxic chemicals in food-producing animals: impact on animal production, residues in food products, safety assessment and control methods.
415. Animal Reproduction Laboratory
Winter. 1(0-3) ANS 455 or concurrently.

416. Growth Biology of Meat Animals
Spring of odd-numbered years. 3(3-0) B S 211, PSL 241, BCH 200.
Fetal and postnatal growth and development in meat animals. Bioenergetics, hormonal, nutritional and metabolic aspects of growth. Criteria for measuring growth of meat animals.

422. Beef Production and Management
(A H 453.) Fall. Spring. 4(3-2) ANS 211, ANS 329 or approval of department.
Feeding, breeding, management, marketing. Emphasis on growth and development; costs and returns; feed requirements; reproduction, crossbreeding, performance testing, housing, diseases. Practice in management skills.

423. Dairy Production and Management
(DRY 313.) Spring. 4(3-3) ANS 232, ANS 313, ANS 415, ANS 455.
Management practices and systems for dairy herds. Systems for records, housing, milking, reproduction, nutrition and health. Economic and efficient use of inputs.

433. Ruminant Nutrition
Winter. 4(3-2) ANS 313.
Principles of ruminant nutrition and application to actual feeding practices in commercial dairy and beef operations. Rumen fermentation as related to feed utilization, growth, milk production and milk composition.

434. Dairy Cattle Breeding
(DRY 484.) Spring. 4(2-4) ANS 314.
Applications of population genetics to improving dairy cattle. Use of selection, aids to selection, and systems of mating to formulate breeding plans. Inheritance of economic traits. Breed improvement programs.

435. Mammary Physiology
(DRY 444.) Fall. 4(3-2) PSL 241, BCH 200 or BCH 401. Interdepartmental with the Department of Physiology.

452. Meat Science Laboratory
(A H 244, A H 344.) Winter. 2(0-5) ANS 456 or concurrent 455.
Exercises in meat animal slaughter, meat cutting, wholesale and retail cut identification, processing, inspection, quality control and merchandising.

454. Meat Animal Breeding
(A H 462.) Spring. 3(2-2) ANS 314.
Uses and effects of different breeding systems with beef cattle, sheep, and swine. Formulating breeding plans.

455. Principles of Animal Reproduction
(DRY 445.) Winter. 4(5-0) PSL 241, BCH 200 or BCH 401. Interdepartmental with the Department of Physiology.
Processes of reproduction and endocrinology with special emphasis on anatomy of reproductive systems, folliculogenesis, gametogenesis, reproductive cycle, fertilization, sex determination, gestation and artificial regulation of these reproductive events for economic benefit.

463. Meat Science and Muscle Biology
(A H 411.) Winter. 4(4-0) BCH 200, PSL 240.
Structure, composition and function of muscle: its conversion to meat, animal growth and fattening. Properties of fresh and processed meat, microbiology, preservation, palatability, inspection and sanitation, by-products, nutritive value.

464. Poultry Breeding and Incubation
(P S 434.) Winter of even-numbered years. 4(3-2) ANS 211 or ANS 261 or approval of department.
Practical application of economic and management principles to commercial poultry enterprises. Field trips required.

465. Avian Physiology
(P S 440.) Spring. 4(3-3) Approval of department.
Principles of nutrition and application of nutritional factors affecting economic characteristics including egg production, egg size, hatchability, growth and viability and factors involved in the hatching of eggs.

469. Avian Diseases and Health
(P S 454.) Winter of even-numbered years. 4(3-2) Approval of department.
Diseases and management of birds emphasizing respiration, circulation, temperature regulation, the endocrine, and reproduction.

472. Sheep Production and Management
(A H 452.) Winter. 4(3-2) ANS 311, ANS 313 or approval of department.
Management of sheep enterprises. Using the tools of selection, reproduction, nutrition, flock health, housing and marketing to increase returns. Practice in trimming, showing, and management skills.

482. Swine Production and Management
(A H 451.) Fall. 4(3-2) ANS 311, ANS 313 or approval of department.
Historical aspects with emphasis on current trends. Breeds, breeding, selection, nutrition requirements, management practices, marketing, housing and environmental needs, disease and parasite problems. Visits to representative farms.

483. Swine Nutrition
(A H 426.) Spring of odd-numbered years. 3(3-0) ANS 313 or ANS 355, ANS 462.
Digestive and metabolic development and nutritional requirements of swine. Interactions of genetics, disease, endocrinology and environment with nutrition. Critical evaluation of swine feeds and feed formulation. Recent swine nutrition research.

485. Analysis of Unbalanced Multifactor Data
Spring. 4(4-0) One course each: biochemistry, physiology, and approval of department.

495. Biometrical Genetics
Fall of odd-numbered years. 4(4-0) ANS 855 and one course in quantitative genetics.
Genetic models for quantitative traits: estimation of components of variance, correlation of relatives; Selection Index Theory; multi-factor and multivariate responses in designed experiments.

826. Animal Nutrition
Spring. 4(4-0) One course each: biochemistry, physiology, and approval of department.

827. Research Methods in Nutrition
Fall. 2(2-0) Approval of department.
Experimental techniques in nutrition: ration formulation, animal management, sampling procedures, balance trials, bioassays, tracer methodology, determination of nutrient requirements.

890. Advanced Special Problems
Fall, Winter, Spring. Summer. 1 to 4 credits. May repeat for a maximum of 8 credits. Approval of department.
Investigation of animal husbandry areas of special interest to individual graduate students.
899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

912. Seminar
Fall, Winter, Spring. 1 credit.

926. Comparative Nutrition-Lipids and Carbohydrates
Winter of odd-numbered years. 4(4-0)
BCH 452, PSL 803 or concurrently. Interdepartmental with and administered by Human Nutrition and Foods. Major aspects of carbohydrate and lipid metabolism as influenced by nutrition in mammals. Emphasis on normal and abnormal physiological states such as obesity, ketosis and diabetes.

927. Comparative Nutrition-Protein Metabolism and Development Biology
Winter of even-numbered years. 4(4-0)
BCH 452, PSL 802 or concurrently. Interdepartmental with and administered by Human Nutrition and Foods. Protein quality assessment; protein status; protein-calorie malnutrition; amino acid metabolism; protein turnover; digestion and absorption; hormonal control of protein metabolism; developmental aspects of protein metabolism and growth.

928. Comparative Nutrition-Minerals
Spring of even-numbered years. 3 credits.
BCH 452, PSL 802 or concurrently. Interdepartmental with Human Nutrition and Foods. Forms and location in body; metabolic roles; deficiency and toxicity signs; interrelationships; requirements and biological availability of sources.

929. Comparative Nutrition-Vitamins
Spring of odd-numbered years. 3(3-0)
BCH 452 and a previous course on principles of nutrition. Interdepartmental with Human Nutrition and Foods. Chemical and physical properties; standards of activity, occurrence, metabolic roles, antagonisms, deficiency and toxicity signs; requirements and factors affecting requirements.

963. Genetics of Breeds Improvement
Winter of odd-numbered years. 3(3-0)

964. Breeding Systems and Plans
Spring of odd-numbered years. 3(3-0)
A II 963. Biometric relations between related animals. Role of selection in changing populations. The effects of different mating systems.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

College of Human Medicine
College of Social Science

100. Human Evolution
Fall, Winter, Spring. Summer. 4(3-1)
Scientific and archaeological evidence on human cultural and biological origins; anticipation of culture in other animals; place of humans among the primates; processes of organic evolution; human genetic variability; culture as an adaptive mechanism; cultural development to the dawn of civilization.

171. Introduction to Sociocultural Anthropology (S)
Fall, Winter, Spring, Summer. 4(3-1) ANP 171.
Introduction to social and cultural analysis: structural functionalism, evolutionism, and cultural ecology.

231. Introduction to Social and Cultural Analysis
Fall, Spring. 4(3-1) ANP 171.
Basic theoretical framework of sociocultural analysis: structural functionalism, evolutionism, and cultural ecology.

250. Culture, Environment and Adaptation (S)
Fall. 4(3-1)
Culture as an adaptive process—developed in the millions of years of human history and still influencing environmental quality, population control, and allocation of resources in primitive and modern societies.

IDC. Introduction to Contemporary China
For course description, see Interdisciplinary Courses.

IDC. Contemporary Japan
For course description, see Interdisciplinary Courses.

262. Status of Women in Culture and Society: A Comparative View
Fall. 3(3-0)
Comparative analysis of the status of women emphasizing non-Western cultures and societies. Economic and domestic divisions of labor between the sexes as a factor underlying division of status, power, and authority.

264. Great Discoveries in Archaeology
Winter. 4(4-0)
Great discoveries in archaeology that have captured the public's imagination and shaped the discipline, from Olduvai Gorge to King Tut's tomb.

265. Vanished Peoples and Lost Civilizations
Fall, Spring. 4(4-0)
Concepts of cultural evolution and origins of civilization as found in popular literature ranging from Atlantis to Chariots of the Gods.

266. War and Aggression
Fall, Spring. 3(3-0)
The question "What makes friends and what makes enemies?" as examined from the standpoint of cultural anthropology. Violence-prone cultures and peaceful ones are compared for factors influencing human aggression.

275. The Anthropology of Asia
Fall. 4(4-0)
Several cultural complexes and culture types—from clanning and gathering through complex civilization—of East, Southeast, and South Asia. The cultures and nature of their development will be examined. Past and present significance of cultural stability and change will be seen in a comparative framework.

281. The Africans and Their Cultures
Spring. 4(4-0)
Racial and cultural problems confronting the African peoples.

285. Anthropological Perspectives on Global Interdependence
Spring. 4(2-2) ANP 171.
Intertwined nature of cultural traditions in the modern world. Consideration of how people of developing nations respond to the dominant cultural forces of industrialized nations.