ARNR 505. Ruminant Microbiology. 2 Credits. (2 Lec) S; Alternate Odd Years PREREQUISITE: BIOM 360, BIOM 405, or MB 505. Explores the taxonomic and morphological diversity of microbial taxa in the ruminant gut and their roles in animal health, nutrition, and productivity.

ARNR 507. Research Methods. 1 Credit. (1 Sem; 5 cr max) FS PREREQUISITE: Graduate standing. Application of scientific method and research techniques, including design of experiments and use of appropriate statistical procedures.

ARNR 508. Rangeland Ecological Theory and Application. 3 Credits. (3 Lec) F alternate odd years. PREREQUISITE: Graduate standing. In this course students will explore the scientific literature and ecological basis for rangeland management practices and will develop an ecological awareness to support critical evaluation of and solution building for ecological problems on arid and semi-arid landscapes.

ARNR 513. Advanced Forage Production. 1 Credit. (1 Lec) F This course is intended to provide graduate students with information pertaining to introduced forage species so that they will be able to effectively determine: what is included in forage quality and its impact on animal performance; determine the role that forages play in agriculture and animal production; evaluate the effects that management strategies and the environment can have on forage production; plan grazing and harvesting strategies based on producer needs and availability; be able to develop their own planning and management strategies based on cases provided.

ARNR 520. Nutrient Metabolism. 3 Credits. (3 Lec) F alternate years, to be offered odd years. PREREQUISITE: ANSC 320, and either CHMY 123 or BCH 380 or consent of instructor. Energy and protein utilization, emphasis on how energy and protein requirements are determined.

ARNR 521. Adv Ruminant Nutrition. 3 Credits. (2 Lec, 1 Lab) F alternate years, to be offered even years. PREREQUISITE: ANSC 320 or consent of instructor. Physiological and microbiology aspects of ruminant digestion and their influence on the metabolism of extraluminal tissues.

ARNR 523. Adv Physiology of Reproduction. 3 Credits. (3 Lec) S alternate years, to be offered odd years. PREREQUISITE: Graduate standing and ANSC 321 or equivalent course. In-depth study of reproductive processes in domestic mammals, with emphasis on the application of recent techniques in solving reproductive problems associated with infertility. Student should have prior understanding of the reproductive anatomy, physiology, and endocrinology of female and male domesticated mammals.

ARNR 524. Adv Animal Breeding. 3 Credits. (3 Lec) S alternate years, to be offered even years. PREREQUISITE: ANSC 322. Quantitative and molecular genetics applied to the improvement of animals. Study of relationships among relatives, methods of estimating genetic parameters, application of crossbreeding systems and selection techniques, and the application of molecular biology to understand the basis of economically important traits in livestock.

ARNR 525. Muscle Growth & Biology. 3 Credits. (3 Lec) S alternate years, to be offered even years. PREREQUISITE: BCH 380 AND BIOP 160. Growth and development of muscle, muscle structure and how growth is controlled by hormones and DNA will be studied. The impact of growth manipulation on the final product, meat, will also be evaluated.

ARNR 527. Livestock Mineral Nutrition. 1 Credit. (1 Lec) F PREREQUISITE: ANSC 320 or equivalent. Lectures will include an overview of livestock mineral nutrition, discussion mineral feed rags and analyses reports, and in-depth discussion of the minerals commonly included in livestock mineral programs.

ARNR 541. Range Ecophysiology. 3 Credits. (3 Lec) S alternate years, to be offered even years. PREREQUISITE: NRSM 240 or BIOP 370 or consent of instructor. Lectures and selected readings on the response of range plants and animals to daily and seasonal changes in their environment, including physiology, animal behavior, and plant population biology.