**ARNR - Animal & Range Natural Res**

**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) F,S 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 years, to be offered 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: BIOL 412, BCH 380, ANSC 321 or consent of instructor. Study of the basic concepts of reproductive process of mammals with special emphasis on the application of recent techniques in solving reproductive problems associated with fertility and infertility.

**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 BIOL 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 tags 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 BIOL 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.

**ARNR 543. Riparian Process & Function. 3 Credits.** (3 Lec) S alternate years, to be offered odd years. PREREQUISITE: NRSM 455, BIOE 370 and ERTH 432R. This course involves an in depth investigation of the geomorphological physical and biological parameters unique to riparian areas of the Northern Rocky Mountains and Great Plains. Emphasis will be placed on how these parameters interact to create the biotic communities associated with riparian areas.

**ARNR 544. Advanced Grazing Management and Ecology. 3 Credits.** (3 Lec) S alternate years, to be offered odd years. PREREQUISITE: NRSM 240 or NRSM 350 or NRSM 351 or BIOE 370. Review of management principles for livestock grazing rangelands and their ecological relationships. Study design and scientific results will be examined to critically review information.

**ARNR 555. Rangeland Wildlife Ecology & Management. 3 Credits.** (3 Lec) F PREREQUISITE: Graduate student standing. Course explores the history, ecology, and management of wildlife populations occurring on rangelands. Emphasis will be placed on habitat and population management with primary consideration of management issues facing wildlife populations in the West.

**ARNR 575. Prof Paper & Project. 1-4 Credits.** (1-4 Ind; 6 cr max) F,S,Su PREREQUISITE: Graduate standing. A research or professional paper or project dealing with a topic in the field. The topic must have been mutually agreed upon by the student and his or her major adviser and graduate committee.

**ARNR 589. Graduate Consultation. 3 Credits.** (3 Ind; max unlimited) F,S,Su PREREQUISITE: Master's standing and approval of the Dean of Graduate Studies. This course may be used only by students who have completed all of their course work (and thesis, if on a thesis plan) but who need additional faculty or staff time or help.

**ARNR 590. Master's Thesis. 1-10 Credits.** (1-10 Ind; max unlimited) F,S,Su PREREQUISITE: Master's standing.

**ARNR 591. Special Topics. 1-4 Credits.** (1-4 Lec; 12 cr max) On Demand PREREQUISITE: Upper division courses and others as determined for each offering. Courses not required in any curriculum for which there is a particular one time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

**ARNR 592. Independent Study. 1-3 Credits.** (1-3 Ind; 6 cr max) On Demand PREREQUISITE: Graduate standing, consent of instructor, approval of department head and Dean of Graduate Studies. Directed research and study on an individual basis.

**ARNR 594. Research Seminar. 1 Credit.** (1 Lec; 3 cr max) F,S,Su PREREQUISITE: A research or professional paper or project dealing with a topic in the field. The topic must have been mutually agreed upon by the student and his or her major adviser and graduate committee.

**ARNR 599. Doctoral Thesis. 1-10 Credits.** (1-10 Ind; 10 cr max) F,S,Su PREREQUISITE: Doctoral standing.
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Adobe Garamond Pro.

The editor may contact Leepfrog for a draft with the correct fonts in place.