ARNR 505 Ruminant Microbiology: 2 Credits (2 Lec)
PREREQUISITE: BIOM 360, BIOM 405, or MB 505. (Sp) S odd years.
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 Credits (1 Other)
PREREQUISITE: Graduate standing. (F, Sp) Application of scientific
method and research techniques, including design of experiments and use
of appropriate statistical procedures. Offered fall and spring
Repeatable up to 5 credits.

ARNR 508 Rangeland Ecological Theory and Application: 3 Credits (3 Lec)
PREREQUISITE: Graduate standing. () F odd years. 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 Credits (1 Lec)
() F odd years. 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)
PREREQUISITE: ANSC 320, and either CHMY 123 or BCH 380
or consent of instructor. () S odd years. Energy and protein utilization,
emphasis on how energy and protein requirements are determined. -

ARNR 521 Adv Ruminant Nutrition: 3 Credits (2 Lec, 2 Lab)
PREREQUISITE: ANSC 320 or consent of instructor. () F even years.
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)
PREREQUISITE: Graduate standing and ANSC 321 or equivalent
course. () S odd years. 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)
PREREQUISITE: ANSC 322. () S even years. 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. Offered spring, even years

ARNR 525 Muscle Growth & Biology: 3 Credits (3 Lec)
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. Offered spring even years

ARNR 527 Livestock Mineral Nutrition: 1 Credits (1 Lec)
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. Fall alternate
years, to be offered odd years.

ARNR 541 Range Ecophysiology: 3 Credits (3 Lec)
PREREQUISITE: NRSM 240 or BIOE 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)
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)
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. Offered spring odd years

ARNR 555 Rangeland Wildlife Ecology & Management: 3 Credits (3 Lec)
PREREQUISITE: Graduate student standing. (F) 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. Offered in fall, even years

ARNR 575 Prof Paper & Project: 1-4 Credits (1-4 Other)
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
Repeatable up to 9 credits.

ARNR 589 Graduate Consultation: 3 Credits (3 Other)
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
Repeatable up to 12 credits.

ARNR 592 Independent Study: 1-3 Credits (1-3 Other)
PREREQUISITE: Graduate standing, consent of instructor. approval of
department head and Dean of Graduate Studies. Directed research and
study on an individual basis
Repeatable up to 6 credits.
ARNR 594 Research Seminar: 1 Credits (1 Lec)
PREREQUISITE: ARNR 507. Graduate students will meet weekly to discuss and critique papers for upcoming departmental seminar speakers. Students will also participate in seminars, and present their research both in an oral and written format. Repeatable up to 3 credits.

ARNR 690 Doctoral Thesis: 1-10 Credits (1-10 Other)
PREREQUISITE: Doctoral standing
Repeatable up to 99 credits.