

NRM 312 RANGE MANAGEMENT (DIRECTED STUDY)

COURSE INFORMATION:

Title: NRM Range Management (Directed Study)

Department/Number: NRM 312 Credits: 3

Prerequisites: Permission of Instructor

Location: Fairbanks Campus

Meeting Dates/Time: TBA 2 hour sessions/week, lecture and/or lab or fieldwork. 6 hours hours/week independent reading and study.

INSTRUCTOR INFORMATION:

SNRE FACULTY

Greg Finstad

LOCAL CONTACT INFO:

Fairbanks Campus

RM 315 O'Neill

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COURSE READINGS/MATERIALS:

Course Textbook: *Range Management: Principles and Practices* (6th Edition):

Author: Jerry L. Holechek, Rex D. Pieper, Carlton H. Herbel Publisher:

Supplementary Readings (Required additional readings): Students will be provided with reading materials

Any Supplies Required: For the fieldwork portion of the course, students should bring appropriate clothing, footwear, and a daypack for performing work outdoors in possible inclement weather

COURSE DESCRIPTION:

Attend lectures, critical reading and discussion of textbook and contemporary grazing ecology literature. Students will also develop field skills in forage plant identification, collection, biomass analysis, stocking density calculations, range evaluation and a range management plan creation. Effective and ecologically beneficial grazing prescriptions requires a solid understanding of plant ecology, animal behavior, and plant-animal

interactions at a particular site. Students will examine the dynamics of grazing, emphasizing the physical, chemical and biological processes influencing grazing systems and the grazing process. Review current foraging ecology and grazing management literature.

COURSE GOALS:

General Description of Goals: The overall goal of this course is for students to gain a broad understanding and perspective on the ecology and management of high latitude grazing systems. Students will also develop skills in forage plant identification, collection, forage production, stocking density calculations, range evaluation and creation of a range management plan.

Student Learning Outcomes/Objectives:

Knowledge and comprehension outcomes/objectives:

- Become familiar with Optimal Foraging Theory and foraging ecology concepts and terminology
- Describe ruminant anatomy and function
- Describe physical characteristics of high latitude grazing systems
- Describe tundra, boreal forest, arctic ecosystems
- Recognize plant-herbivore interactions
- Recognize changes in high latitude ecosystems due to grazing, climate change other disturbances
- Identify and classify Alaskan forage plants by family and species
- Explain forage plant quality

Analysis and application outcomes/objectives:

- Interpret possible responses of high latitude ecosystems to change (i.e. climate, contaminants, grazing, other range manipulations)
- Examine the feedbacks between herbivore and forage in high latitude grazing systems
- Choose various inventory and monitoring schemes based on ecological context and estimate stocking densities for specified grazing systems
- Differentiate between preferred and non-preferred forage species for various herbivores at high latitudes
- Compare and contrast various management tools for grazing management (stocking rates, state and transition models, similarity indices)

Synthesis and evaluation outcomes/objectives:

- Assess grazing resources for a specified species and area
- Compare grazing methods and range manipulations for optimal production
- Plan and assemble a range management plan specific to high latitudes
- Appraise range management policy in Alaska and formulate changes or new ideas
- Evaluate manipulations of various grazing systems in Alaska to predict outcomes.

INSTRUCTIONAL METHODS:

The class will meet 3 times/month for lectures or lab or field exercises. There will be two scheduled exams and a final exam. Students will be given a weekly reading assignment and homework. In addition to the regular course instructor, guest presenters may be scheduled throughout the course to enhance course topics and broaden student perspective.

SYLLABUS / COURSE CALENDAR:

Class 1: Introduction to range ecology and management

- Course introductions, syllabus review
- Range ecology terminology
- Introduction to Optimal Foraging Theory
- Grazing as an ecosystem component
- Biotic diversity
- Definition of plant growth forms and components
- Functional roles of different plant groups
 - Graminoids
 - Forbs
 - Shrubs
 - Trees
 - Lichen
- Below ground productivity, diversity
- Plants and herbivory

Fieldwork

- Set up transects and collect plant samples on AFES pastures for standing crop and biomass analysis
- ID and sort preferred from non-preferred plant species
- Place in drying oven to estimate forage DM production of pasture; reindeer range

Class 2: Alaska Forage Plants

- Characteristics of forage species
- Forage growth cycle
- Nutrient levels in forages (NDF, ADF, Lignin)
- Identification of Alaskan forage plants

Fieldwork

- Identification of Alaskan forage plants and lichens (herbarium and field)
- Lichen identification and characteristics (herbarium and field)
- Identification of high latitude rangeland and ecological sites of the tundra grazing system

Class 3: Grazing Systems at High Latitudes

- Physical characteristics; climate, soils, hydrology
 - The tundra ecosystem
 - The arctic ecosystem
 - The boreal forest ecosystem

Class 4: Grazing ruminant nutrition

- Ruminant morphology
- Ruminant function
- Ruminant ecology

Class 5: Grazing selection and effects on plants and soils

- Selectivity
- Palatability
- Preference
- Defoliation and plant morphology
- Defoliation and plant physiology
- Physical effects on plants
- Physical effects on soils

Class 6: Activities and spatial patterns in grazing

- Ingestive behavior
- Circadian cycle
- Spatial foraging decisions
- Memory, past experiences
- Determinants of grazing distribution
 - Forage factors in site selection
 - Non-forage factors, slope and related physical factors
 - Distance from water
- Exam 1

Class 8: Kind and mix of grazing animals.

- Kind of animal
- Choice of species
- Mixed species grazing
- Interspecific compatibility
- Competition under mixed grazing

Fieldwork

- Identification and define ecological sites for pasture and/or Seward Peninsula
- Forage biomass calculations & analysis
- Calculate stocking densities for pasture and/or sample range area

Class 10: Grazing capacity inventory

- Stocking variables
- Utilization
- Initial stocking rates
- Dynamics of grazing capacity
- Quiz 2

Class 11: Grazing animal intake, equivalence and intensity

- Dry matter intake
- Forage allocation
- Animal equivalence and the animal unit month
- Overgrazing and overstocking
- Grazing intensity effects on vegetation, site, animals and economics

Class 12: Grazing management methods

- Grazing management techniques

Class 13: Grazing management systems

- Rotational grazing
- Deferred grazing
- Rest grazing
- Continuous grazing

COURSE POLICIES:

Students are expected to attend and participate in all class meetings. Students are expected to complete assigned homework critically read the weekly hand-outs. Class participation and discussion is encouraged and important for learning the concepts covered throughout the course.

EVALUATION:

The grading system for the course will be: 90-100% = A, 80-89% = B, 70-79% = C, 60-69% = D, below 60% = F. The student's grade will be based on critical reading and discussing assigned readings (20%), homework assignments (20%) 2 in-class quizzes (10% each), 2 in-class exams (20% each). Unexcused absences, excessive tardiness, and failure to complete course materials and low participation may result in a failing grade.

DISABILITIES SERVICES:

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. State that you will work with the Office of Disabilities Services (203 WHIT-7043) to provide reasonable accommodation to students with disabilities:

DISABILITIES SERVICES TEXT FOR DISTANCE FACULTY SYLLABI
(Approved by Mary Matthews, UAF Disability Services, June 16, 2004)

UAF DISABILITY SERVICES FOR DISTANCE STUDENTS

UAF has a Disability Services office that operates in conjunction with the College of Rural and Community Development (CRCDD) campuses and UAF's Center for Distance Education (CDE). Disability Services, a part of UAF's Center for Health and Counseling, provides academic accommodations to enrolled students who are identified as being eligible for these services.

If you believe you are eligible, please visit <http://www.uaf.edu/chc/disability.html> on the web or contact a student affairs staff person at your nearest local campus. You can also contact Disability Services on the Fairbanks Campus at (907) 474-7043, fydso@uaf.edu.