Texas A&M University

Departmental Request for a Change in Course
Undergraduate • Graduate • Professional
Submit original form and attachments

1. This request is submitted by the Department of ____________________________

2. Course prefix, number and complete title of course: __________________________

3. Change requested
   a. Prerequisite(s): From: ____________________________ To: ____________________________
   b. Withdrawal (reason): ____________________________
   c. Cross-list with: ____________________________

   Cross-listed courses require the signature of both department heads.

   d. Change in course title and description. Enter complete current course title and current course description in item 4; enter proposed course title and proposed course description in item 5.

   e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 6. Attach a course syllabus.

4. Complete current course title and current course description:

5. Complete proposed course title and proposed course description (not to exceed 50 words):

6. a. As currently in course inventory:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
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<td>R L E M</td>
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<td>PLANT AND RANGE ECOLOGY</td>
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<th>CIP and Fund Code</th>
<th>Admin. Unit</th>
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   b. Change to:

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   Approval recommended by: ____________________________
   Date: 8/7/08

   Chair, College Review Committee: ____________________________
   Date: 9/10/08

   Head of Department: ____________________________
   Date: ____________________________

   Dean of College: ____________________________
   Date: ____________________________

   Submitted to Coordinating Board by: ____________________________

   Effective Date: ____________________________

   Questions regarding this form should be directed to Sandra Williams at 845-8201.
   Curricular Services – 11/07

1 of 7 C29
PLANT AND RANGE ECOLOGY
Ecosystem Science and Management 620

Lecture Notes

The Space/Time Continuum in Ecological Systems and Their Interactions.

ASSEMBLED BY:

Dr. Fred E. Smeins
Department of Ecosystem Science and Management
Texas A&M University
College Station, Texas 77843
(Fall 2008)
PLANT AND RANGE ECOLOGY
Ecosystem Science and Management 620
(Fall 2008)
(T, TH 12:45-2:00; Room 317 ANIN)

INSTRUCTOR: Dr. Fred E. Smeins
Department of Ecosystem Science and Management
Room 317, Animal Industries Building
845-7331
f-smeins@tamu.edu

COURSE DESCRIPTION:
Investigation of community/ecosystem/landscape distribution patterns,
structure, spatial/temporal organization and function, paleoecology, ecological
succession, disturbance regimes, ecological diversity and classification
schemes. North America rangeland (grasslands, shrublands, deserts,
wetlands, etc.) stressed but world ecosystems reviewed.

PREREQUISITES:
RENR 205; RENR 215 or equivalent; graduate classification.

LEARNING OUTCOMES
• Able to locate and characterize the ecological features of major rangeland
  regions of North America and the world.
• Capability to assess climate/weather, soil/geology, topography and land use
  as they interact to influence the structure, composition, biodiversity and
  productivity of rangeland ecosystems.
• Familiarity with various approaches to describe and classify the ecological
  condition of rangeland ecosystems.
• Able to assess the mechanisms and process that drive ecological succession
  in rangeland ecosystems and the tools to drive successional trajectories.
• Ability to characterize the geological/historical origin and evolution of
  rangeland ecosystems.
• Have an awareness of the impact of potential global climate change,
  invasive exotic species, habitat fragmentation, nutrient enrichment and
  land use changes on the character and dynamics of rangeland ecosystems.

TEXTBOOK AND READING MATERIALS:
All materials are available to be downloaded from elearning. Make sure that
you have set-up your Neo account. Your Net ID and password will be the
same for elearning. You can login to elearning through the following link:

http://elearning.tamu.edu
COURSE OUTLINE:

I. Viewpoints/Concepts/Definitions
   A. Past, Present and Future Dimensions of Ecology/Rangelands

II. Ecological Definitions and Concepts
   A. Hierarchy Theory
   B. Levels of Organization
   C. Scale
   D. Ecosystem Structure and Function
   E. Landscape Structure and Function
   F. Ecosystem Services
   G. Ecological Sites
      1. Range Condition
      2. State and Transition Models

III. Classifications
    A. Ecoregions – Bailey
    B. Major Land Resource Areas/Regions – USDA, NRCS
    C. UNESCO
    D. U.S. National Vegetation Classification (USNVC)
    E. USDA Soil Classification
    F. EPA Land Unit Classification

IV. Rangeland Regions (Powerpoint)
    A. International
       a. Tropical Grassland, Savannah and Shrubland/Woodland
       b. Desert (Subtropical and Temperate)
       c. Temperate Grassland
       d. Temperate Savannah and Shrubland
       e. Broad Sclerophyll Shrublands and Woodlands
       f. Tundra (Alpine and Arctic)
       g. Other (Wetlands, Forest Range, etc.)
    B. North American

V. Climate/Weather/Soil Interactions
   A. Global Climate Patterns
   B. Climate Modes
   C. Climate Variation
   D. Climate Classifications
   E. Climate/Vegetation Relationships
   F. Climate/Soil/Vegetation Interactions
   G. Climate/Fire/ Vegetation Interactions
VI. Community/Ecosystem Characteristics/Attributes
A. Growth Form and Physiognomy
B. Stratification/Spatial Organization
   i. Vertical
   ii. Horizontal
C. Species Composition
D. Dominance
E. Functional Groups, Plant Strategies, Guilds, etc
F. Keystone Species
G. Ecological Diversity (Biodiversity)
   i. Genetic
   ii. Species
   iii. Communities
   iv. Landscapes
   v. Regions
   vi. Structure, Composition, Pattern, Process, Function
H. Temporal Variation
I. Disturbance Regimes/Succession
J. Assembly Rules

VII. Temporal Patterns/Change
Consider the origin, evolution, and kinds of causative factors that affect the distribution and characteristics of ecosystems of the world with emphasis on North America.

A. Non-directional
   1. Diurnal (daily)
   2. Phenological (seasonal, annual)
   3. Replacement (ontogenetic, regeneration) (annual to decades)
   4. Cyclic Change (years to decades)
   5. Fluctuation (years to decades)
B. Directional Change
   1. Biotic History (phylogenetic and ecological variation under longterm changing environmental conditions-Geological Time)
      a. Pre-Pleistocene
      b. Pleistocene
      c. Holocene
      d. Historical
   2. Succession (variation during relatively constant environmental conditions – Ecological Time)
      a. Primary
      b. Secondary
      c. Models
         i. facilitation
ii. tolerance
iii. inhibition
iv. exclusion
v. population/life history
   Grime History
   Tilman-resource ratios
   Noble and Slatyer – vital attributes
d. Successional Processes/Mechanisms
   i. nudation (=disturbance) theory and characteristics
   ii. migration (agents, mechanisms)
   iii. ecesis (colonization)
   iv. biotic interactions (competition, herbivory, predation, etc.)
   v. reaction (plant and animal influences)
   vi. stabilization: stability-resistance, resilience
e. Equilibrium vs. Non-equilibrium Systems

3. Application to Rangeland Assessment and Condition
   a. Range Condition
   b. State and Transition Models
   c. Rangeland Health

VIII. Field Trip

   A. A two day required field trip will occur on October 20 (Saturday) and 21 (Sunday)

IX. Grade Determinations

   A. Examinations
      ii. Mid term examination (October 7) 100 pts (20%)
      iii. Final examination (December 10; 8:00-10:00) 100 pts (20%)
   B. Group Presentation 100 pts (20%)
   C. Exercises @ 20 to 50 points each 150 pts (30%)
   D. Field Trip Report 50 pts (10%)

   TOTAL 500 pts (100%)

X. Grade categories

90+ = A  
80-89 = B  
70-79 = C  
60-69 = D  
<60 = F
Late Work/Make-up Policy

If you miss a regularly scheduled examination, only written excused absences will be accepted as a pass to take a make-up examination. An excused absence means that illness or some other problems beyond your control prevented you from preparing for, or being present at, a scheduled exam. You must register your excused absence within 7 days of the missed exam. Exercises and reports shall be submitted on the due date; if late they will only be accepted with a written excuse.

Attendance Policy

Attendance will only be taken the first few class periods until drops, adds and other variables that may affect the final enrollment are addressed. Thereafter attendance will not be taken. If you are absent for an extended period you should notify the instructor of the nature of your absence.

For any other questions or concerns, please refer to http://student-rules.tamu.edu

Americans with Disabilities Act (ADA) Policy Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.

Academic Integrity Statement

“An aggie does not lie, cheat, or steal, or tolerate those who do.”

For more information see the Honor Council Rules and Procedures on the web at:
http://www.tamu.edu/aggiehonor

Aggie Honor Code

“An Aggie does not lie, cheat, or steal or tolerate those who do.”

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: www.tamu.edu/aggiehonor/

On all course work, assignments, and examinations at Texas A&M University, the following Honor Pledge shall be preprinted and signed by the student:

“On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work.”