PROPOSAL FOR AN UPPER DIVISION CLUSTER COURSE

Name of faculty member  
Dr. Daniel Johnson

Title of proposed course  
Climatology

When is the course to be offered?  
Spring 2000

Name of Cluster/Cluster coordinator  
Global Environmental Change/ Ansel G. Johnson

Please address the following items in your narrative, keying your text to the corresponding item below:

A. COURSE DESCRIPTION (100 words or less).
   Geog 311 Climatology (4)
   A study of the physical processes which comprise the climatic system, from the global scale to the local scale. Particular attention is given to the nature of climatic variability, its causes, and its implications for human activity. Prerequisite: Geog 210.

B. COURSE DEVELOPMENT. Please indicate whether the course is based on an existing course (and if so, please specify), or is a new course in development. If the course is a revision of an existing course, please explain what form the revision will take (this may be addressed under item C).
   Note: Please be aware that the new General Education requirement is based on different premises from the former "distribution" requirement, and therefore the academic role of upper division courses in General Education will necessarily be different from the previous role.

   This course is an existing course. It has been adapted to the internet, and should be easily adapted to the Global Environmental Change Cluster. The topics deal with one of the major indicators of Global Environmental Change, namely the Climate, how it works, what influences it, what is its past, etc.

C. GENERAL EDUCATION GOALS. Please describe how your pedagogical goals for the course promote the University's goals of General Education as adopted by the Faculty Senate. Please review the relevant sections of the General Education Working Group Report (the document adopted by the Senate in 1993) or the September 16, 1994, report of the General Education Committee (both documents are available in the Office of University Studies, 245 CH). Applicants are reminded that the upper division courses are expected to focus on program goals related to Human Experience and Ethical Issues & Social Responsibility, while continuing to build on the Inquiry and Communication program goals. Course instructors should use active learning strategies and challenge students to display increasingly sophisticated research and communication abilities. Examples of strategies for each of the General Education program goals are listed in the General Education Working Group Report and the report of the General Education Committee. Attention should also be given to how this course functions in tandem with other courses in the cluster in working toward curricular integration within the cluster.
Colleagues are also reminded that upper division UNST courses are a replacement of the former distribution requirement for coursework in the Arts and Letters, Sciences, and Social Sciences. The Committee therefore anticipates upper division courses with scholarly content of the highest standard, consistent with the content level of the "distribution" courses under the previous General Education requirement, and befitting the University's core undergraduate curriculum.

D. COURSE OUTLINE. Please provide a detailed outline of the proposed course. This need not be a completed syllabus, but should include an outline of topics, a preliminary reading list, and the name(s) of instructor(s) committed to teaching the course during its first year.

Dr. Dan Johnson will be teaching this course.

Required Text: Ahrens, C. Donald; Essentials of Meteorology: An Invitation to the Atmosphere (1998); Wadsworth Publishing.

Topical Outline

Introductory Material (Preface)
  Definition of the field
  History of the field
  Controls and elements of climate
  The "climate system"
  The nature of climate variability

Radiation and Energy (Chapters 1-3)
  Atmospheric composition
  Temperature structure of the atmosphere
  Radiation laws
  Solar radiation
  Terrestrial radiation
  Radiation balances and imbalances
  Climatology of temperature - spatial and temporal patterns
  Environmental issues: greenhouse gases/global warming

Atmospheric Moisture (Chapters 4-5)
  Humidity
  Products of Condensation - dew, fog, frost, etc.
  Evaporation/transpiration processes
  Precipitation processes
  Climatology of precipitation - spatial and temporal patterns
  Environmental issues: acid rain; drought/floods

Atmospheric Circulation: Pressure and Winds (Chapters 6-7)
  Pressure and winds
  Idealized general circulation
The westerlies - baroclinic and barotropic conditions
Influence of oceans and continents
Interannual Variability
Environmental issues:
   El Nino and the Pacific Northwest
   Desertification
   Seasonal forecasts

Regional Climatology (Chapter 14 and supplements)
   Koeppen Classification System
   Tropical climates
   Mid-latitude climates
   High-latitude climates
   Mountain climates
   Environmental issue: desertification

Weather Systems and Storms (Chapters 8, 10, and 11)
   Air Masses
   Fronts and Weather
   Extra-tropical Cyclones
   Thunderstorms - climatic aspects
   Tornadoes - climatic aspects
   Hurricanes - climatic aspects

Climate Variability (Chapter 13)
   External and internal causes
   Climate history
   Trends and cycles in the climate record
   Impacts of climate change: water and energy
   Global climate models