COMMON COURSE OUTLINE: Course discipline/number/title: BIOL 1300: Biological Applications of GIS Technology

A. CATALOG DESCRIPTION
   1. Credits: 3
   2. Hours/Week: 3
   3. Prerequisites (Course discipline/number): None
   4. Corequisites (Course discipline/number): None
   5. MnTC Goals (if any): NA

This course will teach the use and application of Geographic Information Systems (GIS), computerized systems designed for the storage, retrieval and analysis of geographically referenced data. Applications of GIS Technology will include using analytical tools to explore at a scientific level the spatial relationships, patterns, and processes of organisms in relation to environmental, biological, demographic, geographic, and physical phenomena. The course will be computer-intensive and project-based.

B. DATE LAST REVISED (Month, year): February 2012

C. OUTLINE OF MAJOR CONTENT AREAS:
   1. Introduction
   2. Basics of Mapping and GIS
   3. Data Methods, Exploration, and Visualization
   4. Mapping Concepts and Design
   5. Sources of Urban and Environmental Data
   6. Mapping Databases
   7. Methods of Spatial Data Analysis
   8. GIS Project Development
   9. Ethical Issues in GIS and Urban Planning

D. LEARNING OUTCOMES (GENERAL): The student will be able to:
   1. Apply GIS technology to identify spatial characteristics of an environment, habitat, community, or general site that will enable him/her to integrate spatial thinking and GIS analysis into his/her academic research and careers.
   2. Understand and perform the basic functions of the most popular software package in use for GIS (ESRI’s ArcGIS package).
   3. Evaluate and spatially analyze numbers and words from spreadsheets and databases.
   4. Apply this information to understand relationships within and between systems, organisms, environments, communities.
   5. Practice using GIS technology in their research, projects, and presentations of their work in this course.

E. LEARNING OUTCOMES (MNTC): NA

F. METHODS FOR EVALUATION OF STUDENT LEARNING:
   1. This course will be computer-based with lectures interspersed to introduce new topics and guide upcoming computer applications and techniques. GIS assignments will build upon each other and include case study projects as a primary learning tool to teach and learn GIS technology. Students will be able to integrate GIS techniques with their individual research projects as part of the Environmental Science program.
   2. Students will regularly practice oral presentations of the progress of their projects in this course, including informal and formal presentations of their scientific work during the semester.
   3. Students will be graded on participation in assignments, discussions, peer review and evaluation, and individual projects.

G. RCTC CORE OUTCOME(S) ADDRESSED:
   - Communication
   - Critical Thinking
   - Global Awareness/Diversity
   - Civic Responsibility
   - Personal/Professional Accountability
   - Aesthetic Response

H. SPECIAL INFORMATION (if any): None