

# COURSE PROPOSAL FORM

SN DB  
11/30/2015

For complete AGSC Course Requirements & Guidelines, please refer our website: <http://stars.troy.edu>

## SECTION 1 - TO BE COMPLETED BY THE INSTITUTION SUBMITTING COURSE FOR APPROVAL

Name of Institution University of North Alabama

Course Prefix & Number ES 251 Course Title Environmental Systems

Semester Credit Hours 4 Does course have a laboratory?  YES  NO

Is what general academic area is this course currently being offered at your institution? (Select one the following)

- Written Composition  Humanities & Fine Arts  Math & Science  Social Science  Other Area \_\_\_\_\_

Check all that apply:

- Initial submission  
 Re-submission  
 Course title/number change  
 Course content change for previously approved course

Course Description (Including prerequisites) as it appears in undergraduate catalog:

ES 251 (4). This course introduces methods of modeling dynamic systems, with particular emphasis on environmental systems which are foundational to the interdisciplinary perspectives of sustainability. A focus on understanding sustainability is placed on predicting the behavior of systems through time. Three class periods; one two hour laboratory per week. Prerequisite or concurrent enrollment: Earth Science ES 131 or ES 133. Course fee: \$50.00

**MUST ATTACH A HARD COPY OF A "REPRESENTATIVE" COURSE SYLLABUS TO THIS FORM**

Contact information for person submitting proposal (name, position, mailing address, telephone number, and email address)

Brenda H. Webb, Ph.D. bhwebb@una.edu 256-765-4334 Box 5065 Department of Physics and earth Science University of North Alabama One Harrison Plaza, Florence, AL 35632-0001

Required Institution Signatures: Department Head/Chair Brenda H. Webb Date 11-18-15  
 College Dean Dr. Christopher Maynard, Associate Dean Date \_\_\_\_\_  
 Academic VP or Provost [Signature] Date 11/18/15

## SECTION 2 - TO BE COMPLETED BY AGSC ACADEMIC COMMITTEE CHAIR

NAME OF ACADEMIC COMMITTEE: Geology and Earth Science

ACADEMIC COMMITTEE RECOMMENDATION:  Recommended for AGSC Approval  Not Recommended for AGSC Approval

VOTING RESULTS: 4 # of YES votes 0 # of NO votes 1 # not voting/abstaining

SELECTED AREA OF APPROVAL:

- AREA I - Written Composition  
 AREA II - Humanities & Fine Arts  
 AREA III - Math & Science  
 AREA IV - Social Science

If NOT RECOMMENDED, please give explanation:

[Empty box for explanation]

Committee Chair Signature [Signature] Date 1/29/16

## SECTION 3 - TO BE COMPLETED BY AGSC CHAIR

AGSC APPROVAL:

- APPROVED  
 NOT APPROVED  
 TABLED

AGSC APPROVAL STAMP  
more detailed syllabus (objectives)

IF TABLED, REASON WHY? \_\_\_\_\_

AGSC Chair: \_\_\_\_\_ Date \_\_\_\_\_

AFTER SECTION 1 (ABOVE) IS COMPLETE, MAIL FORM & COURSE SYLLABUS TO:  
**AGSC/STARS PROGRAM**  
 1101 SOUTH BRUNDIDGE STREET  
 ELC BUILDING - SUITE 107  
 TROY UNIVERSITY  
 TROY, AL 36081  
 THE STARS OFFICE STAFF WILL SEND OUT PROPOSAL TO THE APPROPRIATE COMMITTEE AND, IF RECOMMENDED FOR APPROVAL, WILL THEN BRING THE COURSE BEFORE THE AGSC FOR A FINAL VOTE.

## Earth Science 251 Syllabus: Environmental Systems (Modeling)

Instructors: Dr. Melissa Driskell, Dr. Mark Puckett, Dr. Richard Statom, & Dr. Brenda Webb

**Course Description: ES 251. (4) Environmental Systems.** This course introduces methods of modeling dynamic systems, with particular emphasis on environmental systems which are foundational to interdisciplinary perspectives of sustainability. A focus in understanding sustainability is placed on the predicting the behavior of systems through time. One 2-hour laboratory period meets each week. Prerequisite or Concurrent Enrollment: Earth Science (ES 131 or ES 133) Course Fee \$50.00 (Spring, Fall)

Text (required): Ford, Andrew, 2009, *Modeling the Environment*, 2<sup>nd</sup> edition, Island Press, 400 p.

Supplementary Text: Fisher, Diana M., 2007, *Modeling Dynamic Systems: Lessons for a First Course*, 2<sup>nd</sup> edition, iseesystems.com.

<http://clexchange.org/curriculum/roadmaps.asp>, Creative Learning Exchange System Dynamics and Systems Thinking in K-12 Education, materials for a self-guided study in systems dynamics.

### Learning Outcomes/Objectives

Students will effectively

- analyze data derived through modeling dynamic systems;
- explain how modeling dynamic systems informs planning in order to create and maintain a sustainable, systems-based perspective of the environment;
- compare and contrast data derived from modeling dynamic systems and analyzing static equations and graphs in order to address interdisciplinary, sustainable demands;
- explain and apply the inter-disciplinary nature and perspectives of sustainability; and
- apply dynamic systems data to predict future outcomes over time.

### Selected Content

Introduction to Modeling		Easter Island Model
Causal Loop Diagrams	Equilibrium	Daisyworld Model
Stocks and Flows	Water Flows in Mono Basin	Exogenous Rates
Feedback Systems	Oscillating Systems	
Finding Systems in the World	Epidemic Models	
Graphing Results	S Shaped Growth	
Generic Structures	Positive and Negative Feedback	

**Grades:** In this course, the students will learn by doing, with the instructor acting as a facilitator for learning. Therefore, the grades for the course will be based largely on the homework and projects. Grades will be earned by the following scheme: homework (30%), four projects (each accounting for 10% for a total of 40%), two exams (each accounting for 10% for a total of 20%), and participation (preparedness for each class meeting – 10%).

**Accommodation Statement.** In accordance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973, the University offers reasonable accommodations to students with eligible documented learning, physical and/or psychological disabilities. Under Title II of the Americans with Disabilities Act (ADA) of 1990, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Amendment Act of 2008, a disability is defined as a physical or mental impairment that substantially limits one or more major life activities as compared to an average person in the population. It is the responsibility of the student to contact Disability Support Services to initiate the process to develop an accommodation plan. This accommodation plan will not be applied retroactively. Appropriate, reasonable accommodations will be made to allow each student to meet course requirements, but no fundamental or substantial alteration of academic standards will be made. Students needing assistance should contact Disability Support Services (256-765-4214).

**Other Syllabus Inclusions:**

Title IX, Academic Honesty Statement, and all students' rights statements will be included in the full syllabus.