

College Document # \_\_\_\_\_

UCC Document # 160

Date Received 01/24/06

CATALOG YEAR 2006-2007

(Please use separate form for each add/change)

COLLEGE/SCHOOL : College of Arts & Sciences

Current Catalog Page(s) Affected pg. 261

**Course:** Add: X Delete: \_\_\_\_\_  
(check all that apply) Change: Number \_\_\_\_\_ Title \_\_\_\_\_ SCH \_\_\_\_\_  
Description \_\_\_\_\_ Prerequisite \_\_\_\_\_

If new, provide Course Prefix, Number, Title, SCH Value, Description, prerequisite, and lecture/lab hours if applicable. If in current catalog, copy and paste the text from the and indicate changes in red.

**BIOL 5441 Advanced Plant Physiological Ecology. Four semester hours.**  
This course will examine plant physiological mechanisms that explain ecological patterns. Topics will include the physiological characteristics of plants (photosynthesis, energy balance, water relations, mineral nutrition, growth, and development) and how those characteristics are adaptive to various environments. Prerequisite: graduate standing and permission of the instructor. (Cross-listed with BIOL 4441)

Justification: New course for the Master of Science in Biology.

**Program:** Add: \_\_\_\_\_ Change: \_\_\_\_\_ Attach new/changed Program of Study description and 4-year plan. If in current catalog, copy and paste the text from the and indicate changes in red.

**Minor:** Add: \_\_\_\_\_ Delete: \_\_\_\_\_ Change: \_\_\_\_\_ Attach new/changed minor. If in current catalog, copy and paste the text from the and indicate changes in red.

**Faculty:** Add: \_\_\_\_\_ Delete: \_\_\_\_\_ Change: \_\_\_\_\_ Attach new/changed faculty entry. If in current catalog, copy and paste the text from the and indicate changes in red.

**College Introductory Pages:** Add information: \_\_\_\_\_ Change information: \_\_\_\_\_ Attach new/changed information. If in current catalog, copy and paste the text from the and

indicate changes in red.

Approvals:

Signature

Date

Chair  
Department Curriculum Committee

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Chair  
Department

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Chair  
College Curriculum Committee

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Dean

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**Biology 5441 – Advanced Plant Physiological Ecology**  
Texas A&M International University - Department of Biology and Chemistry

Professor: Dr. Joshua Stevenson  
Section:  
Time:  
Room:

Office: LBVSC 385D  
Office Hours:  
Email: [jstevenson@tamiu.edu](mailto:jstevenson@tamiu.edu)

**Course Description and Objectives**

This course will examine plant physiological mechanisms that explain ecological patterns. Topics will include the physiological characteristics of plants (photosynthesis, energy balance, water relations, mineral nutrition, growth, and development) and how those characteristics are adaptive to various environments. Prerequisite: graduate standing and permission of the instructor.

**Student Outcomes**

- Ability to describe the plant physiological processes that are associated with water balance, mineral nutrition, solute transport, growth, and photosynthesis.
- Ability to compare the general physiological processes mentioned above to adaptations that allow plants to survive in different environmental conditions.

**Text(s) and/ or Reading(s)**

Gurevitch, J., S. M. Scheiner, and G. A. Fox. 2002. *The Ecology of Plants*. Sinauer Associates Inc., Sunderland, MA.

**Course Topics**

Part A – Plant Physiology

1. Transport and translocation of water and solutes
  - Water balance of the plant
  - Mineral nutrition
  - Solute transport
2. Biochemistry and Metabolism
  - Photosynthesis: the light reactions
  - Photosynthesis: carbon reactions
  - Translocation in the phloem
  - Respiration
3. Growth and development
  - Growth
  - Light control of plant development
  - Plant growth regulators

Part B – Ecological Considerations

1. Species as an ecological unit
  - Population structure
  - Allocation and life history patterns
  - Species interactions
2. Community as an ecological unit

- Community concepts
  - Succession
  - Productivity
3. Environmental Factors
- Light and temperature
  - Photosynthesis
  - Soil, water, and plant dynamics

XX is the last day to drop a course or withdraw from the University.

**Evaluation**

Weekly quizzes (drop lowest quiz)	20%	Grade Scale:	A – Excellent	90-100 %
Test #1	20%		B – Good	80-89 %
Test #2	20%		C – Average	70-79 %
Final Exam	20%		D – Passing	60-69%
<u>Paper &amp; Presentation</u>	<u>20%</u>		F – Failure	below 60%
Course Total:	100%			

Final value will be rounded to the nearest full percentage (e.g. 69.49% = D, 69.50% = C)

Weekly Quizzes: Take place at the beginning of Friday classes and will be based on material from the previous week’s lectures. Students not present when the quiz is handed out will not get a quiz and receive a score of 0 for that quiz. When calculating course grade, the lowest quiz score will be dropped.

Tests: The vast majority of test questions will be derived from lecture content, however, a few questions may also be taken from material in assigned textbook chapters that may not have been discussed in lecture. \* Scantron forms required for each exam \*

Paper and Presentation: A library research paper will be completed on a topic chosen from a list provided by the professor. A class presentation will also be given based on this same topic (see supplemental guidelines).

Final Exam: The final exam is comprehensive, but will emphasize material covered since the third exam and will be given only at the date and time stipulated in the university final exam schedule.

WebCT: Lectures online - [http://www.tamtu.edu/webct/WebCT\\_Login\\_Page.shtml](http://www.tamtu.edu/webct/WebCT_Login_Page.shtml)

There will be no make-up tests. Please see the attendance rules in the student handbook regarding valid excuses. Regardless of the excuse, appropriate documentation is required to substantiate the date and time in question.

There will be no extra credit assignments.

This syllabus is subject to change.