TENAS STATE UNIVERSITY
COURSE ADDITION FORM

1. Effective Semester: Fall 2016

2. College: Science and Engineering

3. Department/School/Program: Biology

4. Prefix/Subject Number
   BIO 7430

5. Course Title:
   Proposed Long: Mycology
   Abbreviated: MYCROLOGY

6. Course Description (complete sentences in 50 words or less): This course provides an introduction to the organisms in the Kingdom Fungi and to fungus-like organisms, their ecology and evolution, and their role in industry and disease. Special emphasis will be placed on morphology, culturing, and using laboratory techniques for identification.

7. Prerequisites (Including Minimum Grade Required):

8. Co-Requisites (Including Concurrent Enrollment Allowed):

9. Restrictions:
10. Course Data

<table>
<thead>
<tr>
<th>Instruction Type</th>
<th>Lecture Contact Hours</th>
<th>Lab Contact Hours</th>
<th>Credit Hours</th>
<th>Repeatable for Credit?</th>
<th>Maximum Credit Hours Allowed</th>
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<tbody>
<tr>
<td>1-Lecture</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>Yes</td>
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<td>2-Lab</td>
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<td>3-Practicum/Internship/Student Teaching</td>
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<td>4-Seminar</td>
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<td>5-Independent Study</td>
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<td>6-Private Lesson</td>
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<td>8-Thesis</td>
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<td>9-Dissertation</td>
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<td>0-Individualized</td>
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<td>C-Clinical</td>
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Writing Intensive? | Topics Course?
Yes | Yes | No | No

Valid Grade Mode (choose only one) (See PPS 4.07 for definitions.)
- Standard Letter | X
- Credit/ No Credit | |
- Leveling/Assistantships/ESL | |
- Developmental | |

Course Equivalency(s) (Prefix and Number)
- BIO 7360W

11. Justification for the course action:
Degree: PhD
Major: Aquatic Resources
Minor:
Certificate:

Explain why the new course is needed.
This course will expand elective offerings for the Aquatic Resources program and will replace BIO 7360W as a permanent course.
12. Course Goals and Objectives:
   - Must be stated in measurable terms using action verbs. Please refer to Bloom's Taxonomy of Measurable Verbs.

The goal of this course is to present a general treatment of mycological evolution and diversity with emphasis on species important to industry, agriculture, and medicine. In addition to practicing morphological identification of fungi, students will compare metabolic strategies shown by fungi and employ culturing techniques.

Students will identify fungal species by using basic molecular diagnostic techniques. The techniques required include extraction of fungal genetic material, amplification of targeted diagnostic gene regions, sequencing amplified DNA using Sanger sequencing, and using DNA sequence-based queries of online databases to assign taxonomic identity. Students will compile these data and write a manuscript describing and discussing their results, citing timely and relevant literature. Students will also present their results in the form of an oral presentation.

Objectives:

1. Distinguish fungi from other eukaryotic organisms in terms of structure.

2. Diagram the general evolutionary relationships among major fungal groups, including lichens and slime molds, and list their major, defining characteristics.

3. Identify key morphological features that distinguish groups within fungi.

4. Recall basic information on life histories, ecology, and cell biology of fungi.

5. Describe (a) how fungi are utilized to elucidate genetic principles as well as (b) their metabolites and energy-releasing metabolic pathways.

6. Identify commercially and medically important species. Discuss the impact of fungi on plant, animal, and human pathologies, the food industry, and the production of antibiotics as well as other pharmaceuticals.

7. Identify signs/symptoms of major fungal diseases in plants, animals, and humans.

8. Collect representative field specimens reflecting the diversity of fungi from local habitats. Identify specimens to genus and species, with notes listing fresh and microscopic characteristics.


10. Employ morphology, metabolic characteristics, molecular genetics, and bioinformatics to assign unknown fungal samples to taxonomic groups mimicking diagnostic procedures used in the human health and veterinary sciences.
13. Description of Instructional Methodologies:
   - Examples include lecture, discussions, group projects, role playing, simulations, modeling, field-based activities, writing, cooperative learning, inquiry, experimentation, product design, creative activities, case studies, seminars, internship activities, coaching, etc.

This course will be delivered as a traditional lecture-discussion format course and with practice on culturing techniques and taxonomy. Students will be assigned timely discussion topics based on published research and will lead a discussion of this topic in the lecture. They will be required to leverage genetic technologies and online databases to identify unknown, wild-collected samples as part of their investigation report.

14. Assessment of Student Learning:
   - Examples include tests, projects, presentations, performances, creative works, papers, etc.
   - Must include percentages of total grade assigned.
   - Must have distinct differences between a graduate level course and an undergraduate course (in case of stacked courses).

Students will be evaluated through in-class, multiple choice, short answer, and essay format exams, including two midterms and a final. In addition students will present an oral discussion (seminar) and a manuscript as described above (section 12) and a graduate student specimen collection. Grades in this course are based on the percentage of points earned from the 500 possible, where: 100-90 (A); 89-80 (B); 79-70 (C); 69-60 (D); No Credit below 60 (F).

The distribution of grading will be as follows:
Mid-term and final exams 60%
Semester project 40% (presentation, 10%; manuscript, 10%; collection, 20%)
15. Course Outline:
- Provide a weekly outline as appropriate for an example semester in which the course will be taught.

| Week 1 | What are fungi?  
| Chapter 1 Introduction to the Fungi |
| Week 2 | Morphological Characteristics of Fungi and Reproduction  
| Chapter 4 Fungal Reproduction |
| Week 3 | Fungal taxonomy  
| Chapter 5 Systematics |
| Week 4 | Organisms related to fungi  
| Chapter 6 Organisms Closely Related to Fungi |
| Week 5 | Lower fungi important to man  
| Chapter 7 Zygomycetes |
| Exam 1 |

| Week 6 | Characteristics of fungal organelles and function  
| Chapter 2 Cell Ultrastructure and Function |
| Week 7 | Aerobic and anaerobic respiration in fungi  
| Energy Releasing Metabolic Pathways |
| Week 8 | Higher Fungi I Ascomycetes and importance to man  
| Chapter 8 Ascomycetes |
| Week 9 | Higher Fungi II Deuteromycetes relevant to man and the environment. Medically important species, animal and plant pathogens  
| Chapter 10 Deuteromycetes |
| Exam 2 |

| Week 10 | Higher Fungi III Basidiomycetes significant to man and the environment  
| Chapter 9 Basidiomycetes |
| Week 11 | Fungal metabolites  
| Chapter 11 Secondary Metabolism |
| Week 12 | Fungal diseases in man and animals  
| Chapter 12 Medical Mycology  
| Chapter 13 Systemic Mycoses |
| Week 13 | Pharmaceuticals of fungal origin  
| Chapter 14 Antifungal Pharmaceuticals |
| Week 14 | Fungal genetics  
| Thanksgiving |
| Week 15 | Fungal genetics  
| Mycorrhiza |
| Week 16 | Final Exam |

16. Suggested Textbook(s) and Other Learning Resources:
Page 6 of Course Addition Form:
Prefix/Subject and Number: BIO 7430

- Must list the required and/or recommended resources (e.g., relevant textbooks, course packets, websites), with complete bibliographical data (author, title, date and other publication data) in a standard academic format (e.g., CBE, APA, MLA, Chicago, etc.)

REQUIRED:


RECOMMENDED:


OTHER RESOURCES:

http://www.atcc.org/

http://mycoportal.org/portal/index.php

http://www.bio.utk.edu/fesin/title.htm

http://www.fgsc.net/

http://www.tolweb.org/tree/

17. Bibliography:
- Must include literature other than required textbooks and other learning resources.
- Must demonstrate familiarity with current research. Ordinarily, the bibliography should include scholarship published during the last five years.
- Must conform to a standard academic format (e.g., CBE, APA, MLA, Chicago, etc.) Each bibliography will use only one format.


18. Approvals:

Department Chair/Program Director/School Director

Chair of College Curriculum Committee

Dean of College

Dean of The Graduate College (if applicable)

Chair of University Curriculum Committee (if applicable)

Date 02/12/2015

Date 3/3/2015

Date 3/4/15

Date 7/28/2015