Proposal Form For Addition And Revision Of Courses

1. Proposing College / School: College of Agriculture
   Department: Agronomy & Soils

2. Course Prefix and Number: AGRN 5061/6061
   3. Effective Term: SP 2011

4. Course Title: Soil Microbiology Laboratory
   Abbreviated Title (30 characters or less):

5. Requested Action:
   - [ ] Renumber a Course
   - [ ] Add a Course
   - [ ] Revise a Course
   - Current Course Number:
   - Proposed Course Number:
   - Type of Revision:

6. Course Credit:
   Contact/Group Hours  Scheduled Type (e.g.: Lab, Lecture, Practicum, Directed Study)  Weekly or Per Term?  Credit Hours  Anticipated Enrollment
   Maximum Hours (Repeatability): 20  lab  per term  1  5
   Total Credit Hours: 1

7. Grading Type:
   - [ ] Regular (ABCDF)
   - [ ] Satisfactory/Unsatisfactory (S/U)
   - [ ] Audit

8. Prerequisites, Co-Requisites:
   (Indicate with * if item is recommended but not required; indicate minimum grade, if applicable.)
   Prerequisite(s):
   Co-Requisite(s):
   Pre/Co-Requisite(s):
   AGRN 5053/6066

9. Restrictions:
   - [ ] College
   - [ ] Major
   - [ ] Standing
   - [ ] Degree

10. Course Description:
    (20 Words or Less; exactly as it should appear in the Bulletin)
    Laboratory exercises illustrating ecology, physiology, and biochemistry of soil microorganisms.

10. May Count Either
    AGRN5060/6060
    or
    AGRN5063L/6063
    (Indicate if this particular course cannot be counted for credit in addition to another)

12. Affected Program(s):
    (Respond “NA” if not included in any program)
    Program Type (e.g.: minor, major, etc.)  Program Title (e.g.: MS in Chemistry, Performance Option, Minor in Art)  Requirement or Elective? (required or optional?)
    NA

13. Overlapping or Duplication of Other Units’ Offerings:
    (If course is included in any other degree program, is used as an elective frequently by other unit(s), or is in an area similar to that covered by another college/school, attach correspondence with relevant unit)
    - [ ] Applicable
    - [ ] Not Applicable
14. Justification:

To provide distance-learning students the opportunity to obtain hands-on experiences on campus. Due to the biosafety regulations and equipment needed for laboratory exercises, it is very difficult for distance-ed students to complete the labs on their own. Therefore, a five-day campus visit is necessary for this course.

(Include a concise, yet adequate rationale for the addition/revision of the course, citing accreditation, assessments (faculty, graduate, and/or external) where applicable)

15. Resources:

- ACES/Ag IT
- DLOT
- Laboratory supplies for the course
- Additional hours for the teaching assistant to set up the lab

(Indicate whether existing resources such as library materials, classroom/laboratory space, and faculty appointments are adequate to support the proposed addition/revision; if additional resources are required, indicate how such needs will be met, referencing the appropriate level of authorization -- i.e.: Dean -- where necessary; if no additional resources or shifting of resources will be necessary, respond "Not Applicable")

16. Student Learning Outcomes:

Students will become familiar with the methods used to study soil microorganisms. They will learn aspetic techniques, Gram stain, plate counts, extraction of DNA from soil, as well as how to use a microscope, and how to determine soil microbial biomass, soil enzyme activity, nitrification, denitrification, and symbiotic nitrogen fixation.

(State in measurable terms (reflective of course level) what students should be able to do when they have completed this course)

17. Course Content Outline:

see attached syllabus

(Provide a comprehensive, week-by-week breakdown of course content, including assignment due dates)

18. Assignments / Projects:

see attached syllabus

(List all quizzes, projects, reports, activities and other components of the course grade -- including a brief description of each assignment that clarifies its contribution to the course's learning objectives)

19. Rubric and Grading Scale:

see attached syllabus

(List all components of the course grade -- including attendance and/or participation if relevant -- with point totals for each; indicate point totals and ranges or percentages for grading scale; for S/U grading, detail performance expectations for a passing grade)

20. Justification for Graduate Credit:

see attached syllabus and grading scale.

Graduate students will have more essay questions on the exam and are expected to write a more in-depth discussion for each lab exercises.

(Include a brief statement explaining how the course meets graduate educational standards (i.e.: rigorous standards for evaluation, development of critical thinking and analytical skills, etc.))

(Include below are standard statements regarding course policies. If necessary, a statement may be altered to reflect the academic policies of individual faculty members and/or the academic unit or department, provided that there is no conflict with the Tiger Cub, Faculty Handbook, or any existing university policy.)

REQUIRED STATEMENTS

Attendance: Although attendance is not required, students are expected to attend all classes, and will be held responsible for any content covered in the event of an absence.

Excused Absences: Students are granted excused absences from class for the following reasons: illness of the student or serious illness of a member of the student's immediate family, the death of a member of the student's immediate family, trips for student organizations sponsored by an academic unit, trips for university classes, trips for participation in intercollegiate athletic events, subpoena for a court appearance, and religious holidays. Students who wish to have an excused absence from class for any other reason must contact the instructor in advance of the absence to request permission. The instructor will weigh the merits of the request, and render a decision. When feasible, the student must notify the instructor prior to the occurrence of any excused absences, but in no case shall such notification occur more than one week after the absence. Appropriate documentation for all excused absences is required. Please see the Tiger Cub for more information on excused absences.
Make-Up Policy: Arrangement to make up a missed major examination (e.g., hour exams, mid-term exams) due to properly authorized excused absences must be initiated by the student within one week of the end of the period of the excused absence(s). Except in unusual circumstances, such as the continued absence of the student or the advent of university holidays, a make-up exam will take place within two weeks of the date that the student initiates arrangements for it. Except in extraordinary circumstances, no make-up exams will be arranged during the last three days before the final exam period begins.

Academic Honesty Policy: All portions of the Auburn University student academic honesty code (Title XII) found in the Tiger Cub will apply to university courses. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

Disability Accommodations: Students who need special accommodations in class, as provided for by the Americans With Disabilities Act, should arrange for a confidential meeting with the instructor during office hours in the first week of classes (or as soon as possible if accommodations are needed immediately). The student must bring a copy of their Accommodation Letter and an Instructor Verification Form to the meeting. If the student does not have these forms, they should make an appointment with the Program for Students with Disabilities, 128B Haley Center, 844-2096 (V/T).
Rationale
for
AGRN 5061/6061 Soil Microbiology Lab (1 credit)
Spring 2011
(P/C: AGRN 5063/6066)

Instructor: Dr. Yucheng Feng
Phone: 844-3967
Email: yfeng@auburn.edu
Office: 228 Funchess Hall
Dates: On-campus during Spring Break
Location: 114 Rouse Life Science Bldg.
Pre/Corequisite: AGRN 5063/6066

Course Description:
This course will give students hand-on experiences on types and functions of microorganisms in the soil. As the lab portion of the on-campus Soil Microbiology course, this lab course contains seven lab exercises. The total lab contact hour is 20, which is the same as the lab portion of the on-campus course. Instead of meeting once a week for 10 weeks, this course requires on-campus attendance of distance education students for five days. There are several reasons for having Soil Microbiology Lab on campus.

1) Biosafety. Lab 1, 2, and 7 should be carried out in a Biosafety Level One laboratory. It is very difficult for off-campus students to find such a laboratory to carry out the lab exercises.

2) Equipment and chemical needs. Lab exercises in this course require the use of autoclave, microscope, UV/Vis spectrophotometer, microliter range pipettors, and electrophoresis apparatus, etc. Many reagents used are considered hazardous and need to be disposed of properly. It is impractical to attempt to mail these items to off-campus students.

3) Microbiology is an experimental science. An experimental science is best learned through hands-on experiences. Pictures and videos will facilitate teaching the subject matter, but cannot replace the practical experiments.

The on-campus visit, however, may prevent students residing in remote locations and other countries from taking Soil Microbiology if the course is offered in a combined lecture and lab format. Separation of the lectures and labs into two courses will give students the flexibility of taking the lecture portion of the course only if circumstances prohibit travel to campus.
**Lab Topics:**

<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Lab Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The compound microscope and gram-staining techniques</td>
</tr>
<tr>
<td>2</td>
<td>Enumeration of soil bacteria, actinomycetes, and fungi</td>
</tr>
<tr>
<td>3</td>
<td>Microbial biomass by fumigation-incubation</td>
</tr>
<tr>
<td>4</td>
<td>Phosphatase activity in soil</td>
</tr>
<tr>
<td>5</td>
<td>Extraction of soil DNA</td>
</tr>
<tr>
<td>6</td>
<td>Nitrification and denitrification by soil bacteria.</td>
</tr>
<tr>
<td>7</td>
<td>Symbiotic nitrogen fixation</td>
</tr>
</tbody>
</table>

**Activities:**

Both on-campus and distance education students will carry out the same seven lab exercises as listed above. The principles behind each exercise are covered in the Soil Microbiology Lecture course. At the beginning of each lab, the instructor explains the activities involved. Students then complete the lab activities independently. Students will write a lab report for each lab exercise and turn in their lab notebook for grading. There will be a written exam given at the completion of all lab exercises.

**Assignments:**

Assignments are identical for on-campus and distance education students. Students are required to read the lab handouts before each lab and complete seven lab exercises. Additionally, students need to record lab procedure and data, complete necessary calculations and data analysis, and write a discussion of their lab results. The written exam questions for the labs are incorporated into the mid-term exams for on-campus students, whereas distance education students will take a written exam once they finish all the lab exercises.

**Methods students will use to interact with the professor:**

Prior to arrival on campus, students can download lab handouts from Blackboard. During the five-day campus, students will have face-to-face interactions with the instructor. Students can also reach the instructor by telephone, email, and discussion board on Blackboard during the off campus period of the semester. The instructor will return student’s notebook by mail.

**Evaluation:**

Lab exam and assignments will be evaluated in a same manner for on-campus and distance education students. The grades for distance education students will be based on lab performance, lab notebook, and a written exam. Graduate students will have more essay questions on the exam and are expected to write a more in-depth discussion for each lab exercises.

**Course Description, Objective, Textbook, Grading, and Policy:**

See the syllabus.
AGRN 5061/6061 Soil Microbiology Lab (1 credit)
Spring Semester 2011
(P/C: AGRN 5063/6066)

Instructor: Dr. Yucheng Feng
Phone: 844-3967
Email: yfeng@auburn.edu
Office: 228 Funchess Hall, Auburn University main campus
Dates: On-campus during Spring Break
Location: 114 Rouse Life Science Bldg.

Course Description:
Laboratory exercises illustrating ecology, physiology, and biochemistry of soil microorganisms.

Course Objective:
To acquire hands-on experiences on types and functions of microorganisms in the soil.

Reading Materials:
There is no textbook for this lab course. Handouts for each lab can be downloaded from the Blackboard course website.

Course Content:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Lab No.</th>
<th>Lab Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>8:30–11 am</td>
<td>1</td>
<td>The compound microscope and gram-staining techniques</td>
</tr>
<tr>
<td>Monday</td>
<td>1–3 pm</td>
<td>2</td>
<td>Enumeration of soil bacteria, actinomycetes, and fungi</td>
</tr>
<tr>
<td>Tuesday</td>
<td>3–4 pm</td>
<td>6</td>
<td>Nitrification and denitrification by soil bacteria (setup)</td>
</tr>
<tr>
<td>Tuesday</td>
<td>8:30–11 am</td>
<td>7</td>
<td>Symbiotic nitrogen fixation</td>
</tr>
<tr>
<td>Wednesday</td>
<td>1–3:30 pm</td>
<td>3</td>
<td>Microbial biomass by fumigation-incubation</td>
</tr>
<tr>
<td>Wednesday</td>
<td>8:30–11 am</td>
<td>4</td>
<td>Phosphatase activity in soil</td>
</tr>
<tr>
<td>Thursday</td>
<td>8:30–11 am</td>
<td>5</td>
<td>Prepare lab notebook</td>
</tr>
<tr>
<td>Thursday</td>
<td>1–3 pm</td>
<td>2 &amp; 5</td>
<td>Extraction of soil DNA</td>
</tr>
<tr>
<td>Friday</td>
<td>8:30–10 am</td>
<td>6</td>
<td>Finish Enumeration Lab and DNA Extraction Lab</td>
</tr>
<tr>
<td>Friday</td>
<td>10–11 am</td>
<td>7</td>
<td>Turn in lab notebook. Written exam for the lab.</td>
</tr>
</tbody>
</table>

Grading:
Grades will be based on lab performance, lab notebook, and a written exam. You are required to turn in your lab notebook during the written exam period. The instructor will return your lab notebook by mail by the end of spring semester. The written exam will be given Friday afternoon at the completion of all laboratory exercises. The written exam for graduate students will contain more essay questions than that for undergraduate students.

**Undergraduate Students:**

| Lab performance | 60 points |
| Lab notebook    | 60 points |
| Written exam    | 15 points |
| **TOTAL**       | **135 points** |

**Graduate Students:**

| Lab performance | 60 points |
| Lab notebook    | 60 points |
| Written exam    | 30 points |
| **TOTAL**       | **150 points** |

**Grade scale:** >90% = A, 80-89.9% = B, 70-79.9% = C, 60-69.9% = D, <60% = F

Course Policy:
The one-week laboratory course is made available for distance learning students during the campus spring break period, which usually occurs in the second half of March. Students are expected to attend all lab sessions, bring their own lab notebooks, and turn in lab notebooks during the written exam period. Students are expected to read lab handouts before each lab. Students are responsible for all materials.
presented during the lab periods and in the lab handouts. Students are responsible for their own lodging, transportation, and meals.

**Excused Absences:** Students are granted excused absences from class for the following reasons: illness of the student or serious illness of a member of the student's immediate family, the death of a member of the student's immediate family, trips for student organizations sponsored by an academic unit, trips for university classes, trips for participation in intercollegiate athletic events, subpoena for a court appearance, and religious holidays. Students who wish to have an excused absence from class for any other reason must contact the instructor in advance of the absence to request permission. The instructor will weigh the merits of the request, and render a decision. When feasible, the student must notify the instructor prior to the occurrence of any excused absences, but in no case shall such notification occur more than one week after the absence. Appropriate documentation for all excused absences is required. Please see the *Tiger Cub* for more information on excused absences.

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