Proposal Form For Addition And Revision Of Courses

1. Proposing College / School: Agriculture
   Department: Fisheries and Allied Aquacultures

2. Course Prefix and Number: FISH 5710/6710

3. Effective Term: Spring 2013

4. Course Title: Aquatic Microbiology (OFFERED EVERY OTHER SPRING)

5. Requested Action:
   - [ ] Renumber a Course
   - [X] Add a Course
   - [ ] Revise a Course

6. Course Credit:

<table>
<thead>
<tr>
<th>Maximum Hours (Repeatability)</th>
<th>Contact/Group Hours</th>
<th>Scheduled Type</th>
<th>Weekly or Per Term?</th>
<th>Credit Hours</th>
<th>Anticipated Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>Lecture</td>
<td>3</td>
<td>3</td>
<td>15</td>
</tr>
</tbody>
</table>

   Total Credit Hours: 3

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

8. Prerequisites/Corequisites:
   BIOL1030/BIOL1037 or departmental approval

9. Restrictions: List specific restriction in space above.
   - [ ] College
   - [ ] Major
   - [ ] Standing
   - [ ] Degree

10. Course Description:
    (20 Words or Less; exactly as it should appear in the Bulletin)
    Overview of the diversity, genetics, physiology, and ecology of aquatic microorganisms, with an emphasis on bacteria, archaea and viruses.

11. May Count Either:
    - [ ] not counted
    - [ ] (Indicate if this particular course cannot be counted for credit in addition to another)

12. Affected Program(s):
    (Respond "N/A" if not included in any program; attach memorandum if more space is required)

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Program Title</th>
<th>Requirement or Elective?</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td>(required or optional?)</td>
</tr>
</tbody>
</table>

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)
   - [X] Applicable
   - [ ] Not Applicable
14. Justification:
To provide an entry level course on microbiology for those students interested in aquatic environments. This course will provide the necessary background for upper-level courses in microbiology or related fields.

(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:
N/A

(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:
See attached syllabus

(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

(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.))

(Included 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.)

POLICY 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, subsistence 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 exam, mid-term exam) 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/TT).
COURSE SYLLABUS
FISH 5710/6710
Aquatic Microbiology
Dr. Cova Arias
Office: 253 Upchurch Hall
Phone: 334-844-9215 (or 844-2614)
E-mail: ariascr@auburn.edu
Office hours: TBA

1. Credit hours: 3 h of lecture per week
   Time and location: Tu-Th 9:30 am – 10:45 am 303 Swingle Hall

Prerequisites: BIOL 1030, BIOL 1037 or Departmental approval
                Handouts from the instructor.

3. Course description:
   This course is to provide an overview of the diversity, genetics, physiology, and ecology of aquatic microorganisms, with an emphasis on bacteria, archea and viruses. This course will provide the necessary background for upper-level courses in microbiology or related fields.

4. Student Learning Outcomes:
   The general objective of this course is to introduce the students to basic concepts in freshwater and marine microbiology. In addition to lectures covering the principles and basis of microbial cell structure, physiology, diversity, genetics and ecology, students will be exposed to scientific papers, real data discussions, and virtual diagnosis labs. Specifically, after completion of this course students should:
   1. Enumerate and describe main aquatic environments
2. Understand the diversity of bacterial metabolic pathways and its implications in aquatic microbial ecology

3. Name predominant Bacteria and Archaea groups in the different aquatic environments

4. Understand relationships between microbes in marine and freshwater environments

5. Correlate physicochemical interactions with microbial life styles

6. Understand main topics relating aquatic microbiology and human health
5. Course Content

Subject

Week 1
1. General Introduction to Microbiology
   - The historical roots of microbiology
   - Microorganisms and their natural environment

Week 2
2. Diversity of aquatic environments
   - Pelagic and benthic environments
   - Living on the surface: biofilms
   - Cell wall and cell membranes

Week 3
3. The Bacterial Cell
   - Microbial locomotion
   - Other cell structures

Week 4
4. Microbial physiology
   - Nutrition and growth
   - Major metabolic pathways: autotrophy & heterotrophy

Week 5
5. Nutrient cycles
   - Carbon cycle
   - Nitrogen cycle
   - Sulfur cycle

Week 6
6. Physicochemical parameters: living on the extremes
   - pH, pressure, temperature, salt
   - Extremophiles

Week 7
7. Freshwater environments
   - Lotic and lentic systems
   - The river continuum concept

Week 8
8. Freshwater microbial diversity
   - Algae

Week 9
9. Freshwater cyanobacteria

Week 10
10. Freshwater Bacteria & Arquea

Week 12
Spring Break

Week 13
13. The Marine environment
- Oceans and seas
- Marine snow
- Hydrothermal vents

Week 14
13. Marine Microbial Diversity
   - Algae and cyanobacteria
   - Bacteria & archae
   - Phages

Week 15
15. Symbiosis
   - Quorum sensing

16. Predation

Week 16
17. Aquatic habitats and human health
   - Seafood safety
   - Water treatment plants
   - Aquaculture

6. Grading and evaluation:

6.1. Course requirements: Students should attend class and all exams.

   Arrangements should be made prior to exam date if student will be absent.

6.2. Grading system:

Undergraduate Students:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Grade Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid Term Exam</td>
<td>40%</td>
<td>90-100</td>
<td>A</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
<td>80-89</td>
<td>B</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
<td>70-79</td>
<td>C</td>
</tr>
<tr>
<td>Paper</td>
<td>10%</td>
<td>69-60</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>&lt;60.........</td>
<td>F</td>
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</table>

Graduate Students:

<table>
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<td>70-79</td>
<td>C</td>
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<tr>
<td>Presentation</td>
<td>10%</td>
<td>69-60</td>
<td>D</td>
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<tr>
<td>Paper</td>
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<tr>
<td></td>
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Announced quizzes (with 1-2 days notice) will be given to the students at regular intervals (every 2-3 weeks). These quizzes will account for 10% of the final grade. All students are required to write a paper describing the life of an aquatic microbe from the microbe point of view. Students should follow the style portrayed in ‘The other of the microscope: the bacteria tell their own story’ by Koneman. The instructor will provide examples from previous years. The first draft for the paper is due by Spring break, the instructor will provide constructive criticisms and direct the student in the right direction. Papers are a week before classes end.

At the end of the semester, graduate students are required to present a short lecture (~15 min) on a selected topic not-covered in depth during the course. Evaluation of this presentation will be done by the instructor (60%) and by their classmates (40%). Students will be evaluated based on content, clarity, slide presentation, communication skills, etc...

7. Policies:
All students are expected to attend class on a regular basis. More than five unexcused absences will result in a reduction by one letter grade.

Students who do not comply with Auburn University's academic regulations (i.e., those concerning cheating and plagiarism) will be dealt with in the manner outlined in the Student Policy eHandbook at www.auburn.edu/student_info/student_policies/

Please immediately notify me if you are a student with a University-recognized disability. I will make sure that any special arrangements you may need are made as soon as possible.

8. Justification for graduate credit:
Earning graduate credit for this course means that your grade is based on more points, i.e., more is expected and required of you regarding academic and professional leadership. Because the trait “leadership” is difficult to quantify, you
will be judged by your ability to present a current research topic on aquatic microbiology. This ability will be demonstrated in a 15-minute presentation of your chosen topic. The topic can, and probably should, be related to your graduate research topic but must relate to the lecture materials in the broad sense. In order to give a good presentation you must read several published scientific papers on that topic as well as book chapters. Members of the class will be encouraged to provide constructive criticism of your topic, and it is expected that you will be able to promote dialogue among your peers and field questions from them by introducing data from the peer-reviewed, primary literature published on your topic.