APPLICATION FOR NEW COURSE

1. Submitted by College of Agriculture
Department/Division offering course Plant Pathology Department
Date November 4, 2004

2. Proposed designation and Bulletin description of this course
   a. Prefix and Number PPA 670
   b. Title* Plant Bacteriology
      *NOTE: If the title is longer than 24 characters (including spaces), write
      A sensible title (not exceeding 24 characters) for use on transcripts
   c. Lecture/Discussion hours per week 1
   d. Laboratory hours per week 0
   e. Studio hours per week 0
   f. Credits 1
   g. Course description
      Bacterial mechanisms underlying pathogenesis and virulence in interactions causing plant disease, and
      symbiotic compatibility in mutualisms.
   h. Prerequisites (if any)
      PPA 400G, PPA 500, PPA 600, PPA 640 can be concurrent.
   i. May be repeated to a maximum of N/A (if applicable)

4. To be cross-listed as N/A
   Prefix and Number
   Signature, Chairman, cross-listing department

5. Effective Date Fall 2006 (semester and year)

6. Course to be offered ☑ Fall ☐ Spring ☐ Summer

7. Will the course be offered each year? ☑ Yes ☐ No
   (Explain if not annually)
   N/A

8. Why is this course needed?
   Bacteria are major sources of disease, and knowledge of the mechanisms of bacterial pathogenesis is needed to
   combat such diseases. Also, knowledge of mutualistic bacteria is essential to manage plant health.

9. a. By whom will the course be taught? Christopher Schardl
   b. Are facilities for teaching the course now available? ☑ Yes ☐ No
      If not, what plans have been made for providing them?
      N/A
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10. What enrollment may be reasonably anticipated? 5

11. Will this course serve students in the Department primarily?  
Will it be of service to a significant number of students outside the Department? 
If so, explain.  
☑ Yes ☐ No

☐ Yes ☑ No

Will the course serve as a University Studies Program course?  
If yes, under what Area?  No

☐ Yes ☑ No

12. Check the category most applicable to this course  
☐ traditional; offered in corresponding departments elsewhere;  
☐ relatively new, now being widely established  
☐ not yet to be found in many (or any) other universities

13. Is this course applicable to the requirements for at least one degree or certificate at the University of Kentucky?  ☑ Yes ☐ No

14. Is this course part of a proposed new program?  
If yes, which?  ☐ Yes ☑ No

15. Will adding this course change the degree requirements in one or more programs?*  
If yes, explain the change(s) below  
N/A

☐ Yes ☑ No

16. Attach a list of the major teaching objectives of the proposed course and outline and/or reference list to be used.

17. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted. ☐

18. If the course is 400G or 500 level, include syllabi or course statement showing differentiation for undergraduate and graduate students in assignments, grading criteria, and grading scales. ☐

19. Within the Department, who should be contacted for further information about the proposed course?  
Name Christopher Schardl  
Phone Extension 257-7445x80730

*NOTE: Approval of this course will constitute approval of the program change unless other program modifications are proposed.
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Signatures of Approval:

David A. Smith
Department Chair

Dean of the College

4/22/05

Date

Date

Date of Notice to the Faculty

*Undergraduate Council

Date

*University Studies

Date

*Graduate Council

Date

*Academic Council for the Medical Center

Date

*Senate Council (Chair)

Date of Notice to University Senate

*If applicable, as provided by the Rules of the University Senate

ACTION OTHER THAN APPROVAL

Rev 3/04
PPA 670, Advanced Plant Bacteriology Syllabus

• **Semesters taught:** Every Fall
• **Credit hours:** 1
• **Day/Time:** Fridays, 9:00-9:50 a.m.
• **Prerequisite:** PPA 400G, PPA 500, PPA 600, PPA 640 can be concurrent
• **Requirement:** Option to fulfill the requirement for 2 courses in Advanced Plant Pathology
• **Organizer and Instructor:** C.L. Schardl
• **Major Teaching Objectives:** Give students an in-depth understanding of the biochemistry, genetics, molecular biology and cytology of interactions between plants and bacteria. Emphasis is on the bacterial mechanisms underlying pathogenesis and virulence in interactions causing plant disease, and symbiotic compatibility in mutualisms.
• **Readings:** At least 1 week before each lecture, students will be assigned one review paper and one recent research paper for that lecture.
• **Lecture formats:** Each lecture will begin with a brief overview of the topic, and will conclude with a 15-20 minute critical discussion of the research paper. Students will be assigned to lead the discussions of research papers.

• **Topics:**  
Lecture Topics  
1 Overview of bacterial pathogenesis  
2 Epiphytism & ingress  
3 Hydrolytic enzymes  
4 Toxins: Roles in plant disease  
5 Bacterial secretion systems: Overview  
6 Type III secretion systems  
7 Hypersensitive resistance  
8 **Midterm exam**  
9 Pathogenicity & avirulence factors  
10 Gene regulation & quorum sensing  
11 N₂-fixation: host-bacterium communication in nodulation  
12 N₂-fixation: nodule development, N-fix’n: symbioses  
13 Plant growth regulators, Agrobacterium  
14 Agrobacterium & plant transformation

• **Assignments, Exams and Grades:**  
  Participation: 40 pts  
  Midterm exam: 30 pts  
  Final exam: 30 pts  
  Grades  
  • 90-100%: A  
  • 80-89%: B  
  • 70-79%: C  
  • <70%: E