APPLICATION FOR NEW COURSE

1. Submitted by College of  Agriculture  Date  November 24, 2004
   Department/Division offering course  Plant Pathology Department

2. Proposed designation and Bulletin description of this course
   a. Prefix and Number  PPA 600
      b. Title* Critical Methods in Plant-Microbe Interactions
         *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 2
      d. Laboratory hours per week 0
      e. Studio hours per week
      f. Credits 2
   g. Course description
      The course will provide instruction on experimental methods commonly used in Plant-Microbe Interaction and
      will train students in critical thinking, grant writing, scientific ethics & seminar presentation.
   h. Prerequisites (if any)
      PPA500: Physiology of Plant Health and Disease. (Proposed new course).

i. May be repeated to a maximum of

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

5. Effective Date
   (semester and year)

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

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

8. Why is this course needed?
   Current courses do not teach experimental methods, critical thinking, grant writing, presentation techniques or
   transcript review & discussion-future skills that are essential for a graduate student's future career.

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

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.  
   Advanced undergraduates and graduate students enrolled in PPA 400G may enhance their training by concurrent 
   or subsequent enrollment in PPA 500  

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?  

14. Is this course part of a proposed new program:  
    If yes, which?  

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

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  Mark Farman  
   Phone Extension  80728  

*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

Date

Dean of the College

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
PPA600: Critical Methods in Plant-Microbe Interactions
• Semesters taught: Every Spring
• Credit hours: 2
• Prerequisite: PPA 400G, PPA 500
• Requirement: Option to fulfill the requirement for 2 courses in Advanced Plant Pathology
• Organizer and Instructor: Mark Farman
• Major Teaching Objectives: Current courses do not teach experimental methods, critical thinking, grant writing, presentation techniques or how to read and review scientific papers. Students are not able to pick up these skills in a traditional course because they have a hard time simply keeping up with the large amount of information that needs to be presented if they are to have a good breadth of knowledge in the field of study. The proposed course (which students will take in their second semester) seeks to develop skills that will not only aid them in their future coursework but will benefit them throughout their entire scientific career.
• 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.

Lecture Topic
1. Introduction to the course – outline and expectations
2. The scientific method and good experimental practice
3. Natural variation and genetic analysis of plant-microbe interactions
4. Mutagenesis – classical and insertional (transposon, REMI, ATMT)
5. Biochemical analysis of plant-microbe interactions
6. Scientific ethics and good laboratory note-taking
7. Pharmacological agents
8. Genomic libraries, map-based cloning, functional complementation
9. Gene disruption, gene silencing (RNAi, VIGs)
10. Functional characterization of genes – domain swapping, site-directed mutagenesis, promoter analysis
11. Detection and quantification of biological molecules – Electrophoresis, Southern, Northern, Western analysis, epitope tagging, reverse transcriptase-PCR, real-time PCR
12. Grant Writing 101
14. Molecular Interactions: gel shift assays, far Western analysis, yeast two-hybrid systems, co-immunoprecipitation.
15. Phylogenetics, population genetics
16. Genomics and Bioinformatics
17. Introduction to scientific writing – General organization of a manuscript
18. Independent thinking and critical reading
19. “Hot” topic in bacterial-plant interactions:
20. “Hot” topic in fungal-plant interactions:
21. Peer review of student research proposals
22. “Hot” topic(s) in viral-plant interactions: to be announced
23. “Hot” topic(s) in oomycete – plant interactions
24. “Hot” topic(s) in nematode – plant interactions
25. Keys to successful seminar presentation
26. "Hot" topic(s) in plant disease resistance

• 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