

New Course Request

NOV 11 2008 Indiana University

Indianapolis Campus

Check Appropriate Boxes: Undergraduate credit  Graduate credit  Professional credit  90

1. School/Division Science, Biostatistics 2. Academic Subject Code BIOS  
3. Course Number 515 (must be cleared with University Enrollment Services) 4. Instructor variable  
5. Course Title Biostatistical Practicum

Recommended Abbreviation (Optional) \_\_\_\_\_  
(Limited to 32 Characters including spaces)

6. First time this course is to be offered (Semester/Year): Spring/2009

7. Credit Hours: Fixed at \_\_\_\_\_ or Variable from 1 to 3

8. Is this course to be graded S-F (only)? Yes \_\_\_\_\_ No X

9. Is variable title approval being requested? Yes \_\_\_\_\_ No X

10. Course description (not to exceed 50 words) for Bulletin publication: \_\_\_\_\_  
P: STAT 521; BIOS 527, 546; or consent of instructor. Real-world projects in biostatistics involving participation in consulting sessions, directed reading in the literature, research ethics, design of experiments, collection of data and applications of biostatistical methods. Detailed written and oral reports required. May be repeated, up to 6 credits.

11. Lecture Contact Hours: Fixed at \_\_\_\_\_ or Variable from 1 to 3

12. Non-Lecture Contact Hours: Fixed at \_\_\_\_\_ or Variable from \_\_\_\_\_ to \_\_\_\_\_

13. Estimated enrollment: 5-10 of which 100 percent are expected to be graduate students.

14. Frequency of scheduling: variable Will this course be required for majors? yes n/a

15. Justification for new course: Required course in new biostatistics Ph.D. program

16. Are the necessary reading materials currently available in the appropriate library? yes

17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by: Bart Baku Date 6/6/08  
Department Chairman/Division Director

\_\_\_\_\_  
Date \_\_\_\_\_  
Dean of Graduate School (when required)

Approved by: James M. Murphy Date 6/25/2008  
Dean

Merry L. Queener Date 11/4/08  
Chancellor/Vice-President

Jackie O'Fallon Date 10/1/08  
Curriculum Committee

\_\_\_\_\_  
Date \_\_\_\_\_  
University Enrollment Services

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

**BIOS 515**  
**Biostatistical Practicum**

**Outline of Proposed Course**

**BIOS 515 – Biostatistical Practicum (1-3 cr.)**

Lead Instructors: L. Li, B. Katz, S. Hui, S. Perkins

**A. Course Description and Rationale:**

Statistical data analysis and study design is an art in practice. When and how to apply different statistical models and the interpretation of data analysis results is heavily driven by experience. This course is designed to develop students' skills in study design, data analyses, and oral and written communication through multiple real-life projects. The projects will cover designs and data analyses of observational studies, controlled clinical trials, and laboratory studies. Practical issues in study design and data analysis include but are not limited to sample size and power estimation, interpretation of p-values, phase I to IV trial designs, case-control, case-cohort, retrospective/prospective study designs; ANOVA, ANCOVA, survival analysis, main effect/interaction, multiple comparisons, diagnostic tests, statistical modeling, and data analysis reporting, including both written and oral presentations.

The most important feature of the course is the intended training in the practice of biostatistics in collaborative environments. The course is part of the Biostatistics PhD curriculum.

Course material will be covered by lectures and interactive exercises that include the instructors role playing as statistically naïve investigators. Knowledge gained will be reinforced by homework assignments and programming exercises.

**B. Educational Objectives:**

Students will receive extensive training using real-life examples. By participating in the course, they will acquire hands-on experience in designing, analyzing, and effectively communicating the findings of real-life projects. This course will improve students' practical application of statistical theory, and written and oral presentation and communication skills.

**C. Instructors:**

Lead Instructors: Lang Li, PhD, Associate Professor  
Barry Katz, PhD, Professor  
Siu Hui, PhD, Professor  
Susan Perkins, PhD, Associate Professor

Other instructors: variable

Contact information:

Lang Li, PhD  
Division of Biostatistics  
Indiana University School of Medicine  
410 West 10<sup>th</sup> Street, Suite 3000  
Indianapolis, IN 46202

Office: (317) 274-4332  
Email: lali@iupui.edu

**D. Prerequisites:**

Students are assumed to have completed a graduate level statistics course, such as BIOS 527, 546, or 536, and be familiar with the basic concepts of statistical inference as well as statistical computing. Students who are uncertain about their levels of preparation are encouraged to contact the instructors.

**E. Description for Bulletin:**

P: STAT 521; BIOS 527, 546; or consent of instructor. Real-world projects in biostatistics involving participation in consulting sessions, directed reading in the literature, research ethics, design of experiments, collection of data and applications of biostatistical methods. Detailed written and oral reports required. May be repeated, up to 6 credits.

**F. Required and Recommended Texts:**

The course will use the following textbook:

Harrell, F. *Regression Modeling Strategies*. 2005. New York

**G. Course Content:**

1. Week 1: Project 1 (clinical trial or observational study design) overview.
  - The instructor presents the problem to the student as a biomedical investigator.
  - The students are encouraged to ask questions.
2. Week 2-3
  - Practical consideration of study design will be presented.
  - Students are encouraged to ask questions about both the general methodologies and the project.
3. Week 4
  - Project 1 written report is due.
  - Student oral presentations.
4. Week 5
  - Student oral presentations.
  - Instructor presents alternative solutions.
5. Week 6: Project 2 (data analysis, small one) overview.
  - The instructor presents the problem to the student as a biomedical investigator.
  - The students are encouraged to ask questions.
6. Week 7
  - Practical consideration of data analysis will be presented.
  - Students are encouraged to ask questions about both the general methodologies and the project.
7. Week 8
  - Project 2 written report is due.
  - Student oral presentations.
8. Week 9
  - Student oral presentations.
  - Instructor presents alternative solutions.
9. Week 10: Project 3 (data analysis, big one) overview.
  - The instructor presents the problem to the student as a biomedical investigator.
  - The students are encouraged to ask questions.
10. Week 11-12
  - Practical consideration of data analysis will be presented.

- Students are encouraged to ask questions about both the general methodologies and the project.
11. Week 13
    - Project 3 written report is due.
    - Student oral presentations.
  12. Week 14-15
    - Student oral presentations.
    - Instructor presents alternative solutions.

#### **H. Evaluation and Grading:**

Student's performance will be evaluated through three projects, and each one of them has 33.3% weight. Every project will be evaluated by the relevance and validity of statistical approach, interpretation of the study design and data analysis results, and clarity of written reports and oral presentations. Letter grades for the course are assigned using the following scale: A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: less than 60. Within each letter grade, "+" and "-" will be assigned if the numeric score is in the top and bottom quintiles, respectively. Class participation will also be factored into the final grade.

#### **I. Bibliography:**

N/A

#### **J. Cheating and Plagiarism:**

Academic misconduct will *not* be tolerated and all cases will be reported. Examine the IU Code of Student Rights, Responsibilities, and Conduct at <http://life.iupui.edu/help/code.asp> and in particular examine the rules regarding academic misconduct at [http://life.iupui.edu/help/docs/Part\\_3all.html](http://life.iupui.edu/help/docs/Part_3all.html). Violations of these rules will result in a grade of "F" (or 0%) for the assignment in question, and may result in an "F" for the course or even expulsion from the university (see [http://life.iupui.edu/help/docs/Part\\_4all.html#sanction](http://life.iupui.edu/help/docs/Part_4all.html#sanction)).

#### **K. Americans with Disabilities Act:**

If you need any special accommodations due to a disability, please contact Adaptive Educational Services at (317)-274-3241. The office is located in CA 001E.