The Ohio State University
Colleges of the Arts and Sciences New Course Request

Statistics
_____
Academic Unit
Statistics
_____
Book 3 Listing (e.g., Portuguese)
218   Statistics for the Life Sciences
_____
Number   Title

Stat for Life Sci   U   5
_____
18-Character Title Abbreviation   Level   Credit Hours

Summer   Autumn   Winter   Spring x   Year   2008

Proposed effective date, choose one quarter and put an "X" after it; and fill in the year. See the OAA curriculum manual for deadlines.

A. Course Offerings Bulletin Information

Follow the instructions in the OAA curriculum manual. If this is a course with decimal subdivisions, then use one New Course Request form for the generic information that will apply to all subdivisions; and use separate forms for each new decimal subdivision, including on each form the information that is unique to that subdivision. If the course offered is less than a quarter or a term, please complete the Flexibly Scheduled/Off Campus/Workshop Request form.

Description (*not to exceed 25 words*): Calculus-based introduction to the statistical analysis of biological data, including

probability, common discrete and continuous distributions, experimental design, and hypothesis testing.

Quarter offered: SP   Distribution of class time/contact hours: 3 cl, 2 1-hr recitations
Quarter and contact/class time hours information should be omitted from Book 3 publication (yes or no):

Prerequisite(s):   Math 152 or equivalent

Exclusion or limiting clause: Not open to students with credit for Stat 245

Repeatable to a maximum of _____ credit hours.

Cross-listed with:

Grade Option (Please check):   Letter √   S/U ☐   Progress ☐   What course is last in the series? _____

Honors Statement: Yes ☐ No ☐   GEC: Yes ☐ No ☐   Admission Condition
Off-Campus: Yes ☐ No ☐   EM: Yes ☐ No ☐   Course: Yes ☐ No ☐
Embedded Honors Statement: Yes ☐ No ☐
Service Learning Course*: Yes ☐ No ☐ *To learn more about this option, please visit http://artsandsciences.osu.edu/currofc/

Other General Course Information:
(e.g. "Taught in English." "Credit does not count toward BSBA degree.")

B. General Information

Subject Code__27.0501_____   Subsidy Level (V, G, T, B, M, D, or P)____B_____
If you have questions, please email Jed Dickhaut at dickhaut.1@osu.edu.

1. Provide the rationale for proposing this course:
Many students in the biological sciences take a course in Statistics, either as an elective or to satisfy a requirement in their major. This course will provide topic coverage tailored for the analysis of biological data, with discipline-specific examples and activities incorporated.

2. Please list Majors/Minors affected by the creation of this new course. Attach revisions of all affected programs. This course is (check one): ☐ Required on major(s)/minor(s)   √ A choice on major(s)/minors(s)
                                    ☐ An elective within major(s)/minor(s) ☐ A general elective:
Satisfies an option in Evolution & Ecology major – see letter from Tom Heatherington, Chair of EEOB Curriculum Committee

3. Indicate the nature of the program adjustments, new funding, and/or withdrawals that make possible the implementation of this new course.

    This course is being developed and taught by a new faculty member with a joint appointment in Statistics and Biological Sciences. With the switch in the Evolution & Ecology major requirement, this is expected to be a viable course.

4. Is the approval of this request contingent upon the approval of other course requests or curricular requests?

    Yes ☐   No √   List:

5. If this course is part of a sequence, list the number of the other course(s) in the sequence:_____

6. Expected section size: 40   Proposed number of sections per year: 1

7. Do you want prerequisites enforced electronically (see OAA manual for what can be enforced)? Yes √ No ☐

8. This course has been discussed with and has the concurrence of the following academic units needing this course or with academic units having directly related interests (*List units and attach letters and/or forms*):
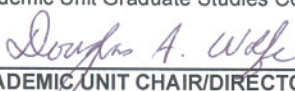   Not Applicable ☐
    See attached support letter from Dr. Joan Herbers, Dean of the College of Biological Sciences

9. **Attach a course syllabus that includes a topical outline of the course, student learning outcomes and/or course objectives, off-campus field experience, methods of evaluation, and other items as stated in the OAA curriculum manual and e-mail to asccurrofc@osu.edu.**

    CONTACT PERSON NAME: Laura Kubatko   E-MAIL kubatko.2@osu.edu   PHONE: 247-8846

Approval Process The signatures on the lines in ALL CAPS (e.g. ACADEMIC UNIT) are required.

William Notz	WILLIAM NOTZ	11/13/07
1. Academic Unit Undergraduate Studies Committee Chair	Printed Name	Date
2. Academic Unit Graduate Studies Committee Chair	Printed Name	Date
Douglas A. Wolfe	Douglas A. Wolfe	11/13/07
3. ACADEMIC UNIT CHAIR/DIRECTOR	Printed Name	Date

4. **After the Academic Unit Chair/Director signs the request, forward the form to the ASC Curriculum Office, 4132 Smith Lab, 174 West 18th Ave. or fax it to 688-5678. Attach the syllabus and any supporting documentation in an e-mail to asccurrofc@osu.edu. The ASC Curriculum Office will forward the request to the appropriate committee.**

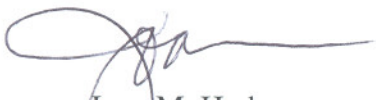|		
5. COLLEGE CURRICULUM COMMITTEE	Printed Name	Date
6. ARTS AND SCIENCES EXECUTIVE DEAN	Printed Name	Date
7. Graduate School (if appropriate)	Printed Name	Date
8. University Honors Center (if appropriate)	Printed Name	Date
9. Office of International Education (if appropriate)	Printed Name	Date
10. ACADEMIC AFFAIRS	Printed Name	Date

November 13, 2007

Committee on Curriculum and Instruction
Colleges of the Arts and Sciences
The Ohio State University
114 University Hall
230 N. Oval Mall
Columbus, OH 43210

Dear Committee Members:

I am writing in support of the course proposal for Statistics 218 (Statistics for the Life
Sciences) developed by Dr. Laura Kubatko. In addition to being appropriate to satisfy a
requirement in some of our majors (for example, the B.S. in Evolution & Ecology), the
course will be a useful option for many of our undergraduates majoring in the biological
sciences. I thus enthusiastically support approval of this course.

Sincerely,

Joan M. Herbers
Dean

Department of Evolution, Ecology and Organismal Biology

College of Biological Sciences
318 West 12th Avenue
Columbus, OH 43210-1293

Phone (614) 292-8088
Fax (614) 292-2030

November 5, 2007

The Committee on Curriculum and Instruction
Colleges of the Arts and Sciences
The Ohio State University

Dear Committee members,

The Curriculum Committee of the Department of Evolution, Ecology, and Organismal Biology has reviewed the course proposal for Statistic 218 (Introduction to Statistics for the Life Sciences) developed by Dr. Laura Kubatko and enthusiastically endorses the course for our Evolution & Ecology majors. The examples and lab exercises in 218 are more focused on problems and analysis of data of biological interest compared to Statistics 245, and the Committee feels that the course will be more effective in teaching our majors basic statistical theory and skills.

Sincerely,

Thomas E. Hetherington
Associate Professor of EEOB
Chair, EEOB Curriculum Committee

cc: Dr. Peter Curtis, Chair, EEOB

Sample Syllabus - Stat 218 - Statistics for the Life Sciences

Instructor: Dr. Laura Kubatko
Office: 219 Cockins Hall
Office Hours: TR 1:30-2:30; other times by appointment (example)
Office Phone: 247-8846
E-mail: lkubatko@stat.osu.edu

Required Text: Statistics for the Life Sciences, 3rd edition, by Myra Samuels and Jeffrey Witmer, Prentice Hall, 2003.

Course Description: Statistical methods play an important role in the analysis of data collected in the biological sciences. This course will provide an introduction to the analysis of biological data in a statistical framework. The topics covered include the definition of probability and manipulation of probabilistic quantities; the common discrete and continuous distributions used in modeling biological phenomena; experimental design; and statistical methods for testing hypotheses.

Website: Please visit http://telr.osu.edu/carmen/. Check Carmen periodically for announcements about the class and other class material.

Homework: Homework problems will be assigned and graded for each topic covered in the course. Homework must be turned in during lecture on the date it is due. If you are unable to attend lecture when the homework is due, you must bring it to me in my office earlier in the day. Please write your name on the top of each page of your assignment, and staples the pages together.

Recommended Homework Exercises: Each homework assignment will include exercises that are "recommended, but not due". These are fair game in terms of concepts for the quizzes and exams. Solutions to these exercises will be posted on the course website.

Exams: There will be two midterm exams and one final exam. The first midterm exam will be given during the fourth week of classes, and the second will be given during the eighth week of classes. The final exam will be comprehensive with an emphasis on those topics covered after the midterm. Statistical tables will be provided as needed. Calculators may be used on the exams, but the calculators on cell phones, PDAs, or any other communication device are NOT allowed.

Notes for use on the exams: You may use one 8.5 x 11 inch sheet of paper (both sides), with whatever facts, formulas, or explanations you find helpful, for the midterm exams. Two sheets of paper (as described for the midterms) may be brought to the final exam.

Makeup exams: If you absolutely need a makeup exam and have a valid excuse, please see me (not your recitation instructor) for the necessary arrangements. However, you must notify me in advance in such a situation. A make-up exam may be a bit harder than the regularly scheduled exam and must be taken within a week of the missed exam. Exceptions to this policy will be permitted only in extreme situations such as serious injury immediately prior to an exam or severe illness requiring hospitalization.

Full credit on homework and exam problems: You need to show your justification for or work on each homework or exam problem. Answers without work will not receive full credit.

Final Grade: Your final course grade will be based on the following weighting of assessment components:

Homework – 20%   Participation in lab – 10%

Midterm exams – 20% each   Final exam – 30%

StatCrunch Software: OSU has a site license for the software package StatCrunch. You can access StatCrunch through the course website. Your TA will help you learn to use StatCrunch for statistical analysis during recitation, but you should also expect to put in time outside of recitation doing data analysis with StatCrunch for homework.

Study Rooms and Help Hours: Your TA, (name - TBD), will hold office hours in the tutor room on the first floor of Cockins Hall on (day - TBD) from (time - TBD), starting the second week of classes. In addition, you are welcome to talk with any TA in the tutor room any time the tutor room is open. Specific hours for the tutor room will be posted on Carmen.

Academic Misconduct: Please help us to maintain an academic environment of mutual respect, fair treatment, and personal growth. You are expected to produce original and independent work for quizzes and exams. Although students are often encouraged to work together on homework assignments, all students must submit their own written work IN THEIR OWN WORDS. Academic misconduct will not be tolerated and will be dealt with procedurally in accordance with University Rule 3335-31-02. (This policy can be found at http://oaa.osu.edu/procedures/1.0.html.)

E-mail Correspondence: In order to protect your privacy, all course e-mail correspondence must be done through a valid OSU name.nn account. If you have not activated your OSU email account, you can activate your account at https://acctmgt.service.ohio-state.edu/cgi-bin/KRB1EntryAdd.

Special Accommodations: All students who feel they may need accommodations based on the impact of a disability should contact the instructor privately to discuss their specific needs. Students with documented disabilities must also contact the Office of Disability Services (ODS) in 150 Pomerene Hall (phone: 292-3307) to coordinate reasonable accommodations for the course. ODS forms must be given to your instructor as early in the quarter as possible to be filled out and returned to you.

Drop dates: The last day to drop the course without a "W" appearing on your record is (date - TBD). The last day to drop the course without petitioning is (date - TBD).

TENTATIVE LECTURE AND RECITATION SCHEDULE

Week 1					
M	Introduction, methods for displaying data	2.1, 2.2, 2.3	T	Intro to StatCrunch software	
W	Descriptive statistics	2.4, 2.5	R	Displaying data	
F	Samples and population, random sampling	2.6, 2.8, 3.1, 3.2			
Week 2					
M	Intro to probability	3.3	T	Lab activity: Random sampling	
W	Probability	3.4, 3.5	R	Problem solving	
F	Bayes Theorem	3.5, notes		**Homework #1 due**	
Week 3					
M	Random variables	3.7, 3.8	T	Discrete random variables	
W	Binomial distribution	3.8	R	Lab activity: Binomial distribution	
F	Geometric & Poisson distributions	notes		**Homework #2 due**	
Week 4					
M	Continuous distributions	notes	T	Review for exam	
W	**Exam #1**		R	Problem solving	
F	Continuous distributions	notes			
Week 5					
M	Normal distribution	4.1, 4.2, 4.3	T	Lab activity: probability plots	
W	Normal distribution	4.4	R	Problem solving	
F	Sampling distributions (in class activity)	5.1, 5.3		**Homework # 3 due**	
Week 6					
M	Estimating means	5.2, 6.1, 6.2, 6.3	T	Problem solving	
W	Confidence intervals for means	6.3, 6.4, 6.5	R	Problem solving	
F	Estimating proportions, CIs	6.5, 6.6		**Homework #4 due**	
Week 7					
M	Comparing two means	6.6, 7.1, 7.2	T	Lab activity: CIs	
W	Comparing two means, hypothesis testing	7.3, 7.4, 7.5	R	Problem solving	
F	Hypothesis testing	7.4		**Homework #5 due**	
Week 8					
M	Hypothesis testing	7.5, 7.6, 7.10	T	Review for exam	
W	**Exam #2**		R	Lab activity: Hypothesis testing	
F	Comparing proportions, categorical data	10.1			
Week 9					
M	Categorical data	10.2, 10.7	T	Problem solving	
W	Categorical data	10.7, 10.3	R	Problem solving	
F	Principles of design	8.1, 8.2, 8.3		**Homework #6 due**	
Week 10					
M	No class – holiday		T	Problem solving	
W	Linear regression	12.1, 12.2, 12.3	R	Lab activity: Regression	
F	Linear regression	12.4, 12.5, 12.6		**Homework #7 due**	