

**Introduction to Biometrics Syllabus 454/554; MATH 354E
Spring 2009 – DR. WYNGAARD & DR. JAHAN**

Lecture: Tuesday, Thursday 2:00 – 3:15 am; Miller 6110
Laboratory: Thursday 3:30 – 4:30 pm, Burruss 031

Section: 0001

Dr. Grace

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Tu/Th 12:30 – 1:30 pm

and by appointment

Help Desk Hotline Number for questions about computers: 540-568-3555

Required Text: Whitlock, M.C. and D. Schluter. 2009 *The Analysis of Biological Data*, Roberts and Co. publishers, ISBN 978-0-9815194-0-1.

Optional Texts that are available inexpensively online:

Dowdy, S. and S. Wearden. 1991. *Statistics for Research*. John Wiley & Sons, NY 537 pp, Second edition. This text is perhaps the best text for reviewing the description and assumptions of each statistical test. Each lecture on the application of a statistical test that we cover in this course will be preceded by a homework assignment that requires you to review that statistical test. (1st & 3rd editions are fine to use also. 1st & 2nd editions have easily readable type and figures and can be found inexpensively online. The 3rd edition covers a lot of material that is beyond this course, has tiny type and figures, and costs twice as much as previous editions.) If you no longer possess the text you used for Math 220 or you lack another introductory statistics book, you would be advised to use this student friendly book that previous biometry students have loved.

Zar, J.H. 1996. *Biostatistical Analysis*, Prentice Hall, N.J. 3rd edition. First & 2nd editions have typos in some statistical formulae. This book is especially useful as a reference text and provides more methods for performing power analyses than any other text of which we are aware. Students who plan to do research and to analyze their own data will find it to be, perhaps, the most useful book on their shelf.

Why co-teaching by a biology professor and a statistics professor?

- To integrate different disciplines
- To create a structure in which biology and mathematics/statistics students work together
- To provide alternative methods of instruction for students
- To provide students with an interdisciplinary learning experience
- To provide students with additional support and assistance

All of the above should result in “helping students achieve their highest potential”

Course Objectives:

1. To understand which statistical procedure is appropriate for a specific research situation
2. To understand the basic theoretical concepts of inferential statistics
3. To understand the major principles of experimental design and how to apply them
4. To be able to evaluate statistical analyses performed by others, especially those presented in published scientific papers
5. To understand the application of statistics in the field of biology.

Prerequisite: You must have had Math 220 or a comparable statistics course.

Grading: Your grade in **BIO 454/MTH 354E** will be derived from:

- 20% completion of the homework and participation in the discussion
- 25% take home exam 1
- 25% take home exam 2
- 30% take home comprehensive final exam

Grading: Your course grade in **BIO 554** will be derived from:

- 10% completion of the homework and participation in the discussion
- 25% take home exam 1
- 25% take home exam 2
- 10% presentation to class on statistical aspect of your thesis research
- 30% take home comprehensive final exam

Homework: Homework assignments on short problems and reviews of statistical tests will be due typically on the following class meeting. Discussion Guide Worksheets of published papers must be completed typically one week after they are assigned. Completed assignments will be discussed and explained in class by randomly chosen students. Homework will not be turned in or graded, although we will gladly look at it during office hours. Statistics is best learned by working on problems or analyzing research papers, i.e., by *doing* the homework. You may work with fellow classmates on the homework, but each person should understand how to work each problem.

You are required to bring the Whitlock & Schluter text to class. Many of the graphs, tables, equations, and examples covered in class will be taken from this text. Having the book with you in class will greatly *ease* your note taking.

Exams: All exams will be take-home exams and will be designed to test your understanding of the principles of experimental design and how well you have mastered the application of basic concepts of inferential statistics to biological problems. Students must work independently on the take-home exams, although they may use their own lecture notes, completed homework assignments, and any published written sources for reference. All discussion and requests for

clarification must be sought only from the professor. Failure to comply with this is a violation of the JMU Honor Code. **Electronic copies of final exam must be deposited to the course blackboard site by Thursday, May 7 at 10 am.**

At least one week of notice will be given before an exam is distributed to students. Examinations that are turned in late will have 10 points deducted from the score for each 24 hours, or portion thereof, that they are late. If you anticipate that you will turn in an exam late, please notify Dr. Wyngaard or Dr. Jahan as soon as possible or have someone else make the contact. Grades will not be discussed or given out over the telephone.

Attendance: Regular class attendance is highly recommended as this coursework includes regular contributions to class discussion and active engagement in homework during the computer laboratories. If you are absent and your name is randomly chosen to cover that day's homework, and you do not have an excuse that is acceptable to the professors, you will have 5 points deducted from your course grade. Receiving 10 or 20% for class discussion of homework necessitates regular contributions to class discussion. You are responsible for all class activities, including announcements.

Class participation: Five points will be deducted from the final grade (out of total of 100 points) for each time your name is randomly chosen to discuss a homework problem, but you are unprepared to do so. For example, a student who comes to class unprepared and is called upon to present a solution to the class, will have five points deducted from his/her final semester grade. If a student has an unexcused absence from class and his/her number is chosen in the random numbers table to present a homework solution, five points will be deducted from the final grade.

Computer laboratory in Burruss 031: The statistical software package SPSS has been loaded on the PCs in the computer laboratory. We will introduce most computer based homework assignments during the lecture portion of the class. We will be available to help students navigate the software during the scheduled Thursday 3:30 – 4:30 pm lab period when you can be assured that seats will be available to you. Students may work together and cooperate during these laboratories, but we emphasize again that it is important that each student understand how to use the SPSS software. You will need to know these skills for each exam and it would be a violation of the JMU Honor Code for you to seek the help of anyone other than the professor in using these facilities or software during exams. You will learn in the laboratory all the software you need to know in order to excel in this class. Access to the lab requires a code. If you use the Burruss Hall or Roop Hall computer labs at other times and need help, please contact Dr. Wyngaard or Dr. Jahan who may be able to help you outside of the scheduled classroom times. We expect that you will likely use SPSS at times that are more convenient for you than the weekly hour scheduled on Thursdays.

There are some courses scheduled to use the Burruss 031 computer lab regularly and you will not have access to the lab at that time. Check the announcements on the door for these times. Additional **JMU computer labs that have SPSS can be found at this web address:**

For an up-to-date list of JMU computer labs with SPSS 15 check <https://remedy.jmu.edu/labs/onesoft.asp?softname=SPSS>.

On 7 January 7 2009, this list of numbers of rooms & computers included:

General Labs

Mac

[Duke 110](#) 16
[East Campus Library 1310 \(Mac\)](#) 16
[Harrison 103](#) 16
[Hillside Mac](#) 16
[Moody 203](#) 16
[Music B59](#) 16

PC

[Carrier 101](#) 16
[Chandler 134](#) 16
[East Campus Library 1310 \(PC\)](#) 16
[Godwin 342](#) 16
[HHS2037](#) 16
[Harrison 111](#) 16
[Harrison 117](#) 16
[Hillside PC](#) 16
[Maury 203](#) 16
[Memorial 7260 \(ETMC\)](#) 16
[Miller 2101](#) 16
[Showker 206-8](#) 16

Computer Ethics and Conduct: All students who take this course are required to abide by the policies set forth by Mr. Lon Jarvis, the Biology Department's Computer Specialist.

1. No food or drinks at any time.
2. Downloading and installing applications on lab computers is strictly forbidden and can result in your loss of lab privileges.
3. Using the printer in Burruss 031 for anything other than Biology coursework is strictly forbidden.
4. Problems in Burruss computer lab 031 should be reported to Lon Jarvis in Burruss 233, jarvislb@jmu.edu, 568-2836

THE JMU HONOR CODE should be carefully observed. Please become familiar with "Violations of the Honor Code" found in the JMU Student Handbook. Any evidence of a violation will be turned over immediately to the Honor Council for their investigation. Studying from previous examinations before a test and studying together before examinations are encouraged and are not Honor Code violations.

Course Registration: Students are responsible for registering for classes and for verifying their class schedules on e-campus.

"Students with disabilities who require reasonable accommodations to fully participate in course activities and/or meet course requirements must register with the Office of Disability Services (ODS) and contact me to discuss access issues. ODS will provide you with an Access Plan Letter that will verify your need for services and make recommendations for accommodations to be used in my classroom. ODS is located in the Wilson Learning Center, Room 107; Phone: 568-6705."

This is a reminder about the University deadlines and the policy on course withdrawal found in page 20 in **Undergraduate Catalog**. According to policy, a student may withdraw from a course before the deadline for course withdrawal and receive a "W" grade. **After** the course adjustment period, in extraordinary circumstances a student who cannot complete a course may approach an instructor directly and request a "WP" or "WF" grade in the class. The form and timing of such requests are to be determined by the individual instructor. In response to a request the instructor may choose to record a grade of "WP" (withdrawal passing) or "WF" (withdrawal failing), but is not obligated to do so and may choose to issue any grade other than a "W" to the student. The instructor will assign the "WP" or "WF" grade at the time final grades are entered.

The drop/add deadlines for Spring Semester 2009 are as follows:

January 20, 2009

Last day to drop a first block or full semester course. 'W' applies at midnight

Last day to add a first block or full semester course on e-campus.

January 29, 2009

Last day to add a first block or full semester course with instructor & unit head signatures.

January 30, 2009

Last day to withdraw from JMU with cancellation of tuition charges

(Student must withdraw from ALL classes to be eligible for refund.)