Course Objectives: The overall objective of this course is to instill in students a practical understanding of and appreciation for the role of statistics in biological science. Emphases will include conceptualization of experimental design, execution of a variety of statistical tests using available computer packages, proper written and oral expression of statistical results, and interpretation of statistical results, especially with regard to hypothesis testing. Considerably less emphasis will be placed on probability, statistical theory, computational aspects of statistical analysis, or graphical/tabular presentation of statistical results.

Statistical Packages: SAS (v. 8.01) will be used to illustrate examples in class, and students are encouraged to learn and use SAS in the course. SAS will be available to students in the class, on individual PC's in Room 150 Mendel, and/or by providing student access to run SAS on Villanova server. Students are free to use other statistical packages, but are forewarned that not all packages are as powerful as SAS. Further, if a student opts to use a statistical package other than SAS, I cannot promise to provide technical assistance in the use of the package.

Grading: The grade will be based on a total of 350 points, distributed as follows: 7 homework assignments (3, 20 pts. each and 4, 10 pts. each); an abstract (15 pts.) and 15 minute oral presentation (75 pts.), and a take-home final (150 points; 50 points on material not covered in homework assignments, 100 points comprehensive). Attendance and class participation will be taken only if a student's final grade is borderline between two letter grades.

Homework assignments will be distributed on Wednesdays and will be due at the beginning of class on the following Wednesday (unless indicated otherwise on the syllabus). Hand-written assignments will not be accepted. I will make every effort to grade and return homework assignments within 1 week. All assignments are required. Assignments submitted late will be assessed a penalty of 10 % per day (or part of a day) late.

The abstract and oral presentation will be centered around a published paper in which statistical analysis either was not performed and should have been, or in which the statistical analysis was inappropriate for the experimental design and data collected. Each student will be required to find such a paper by independently searching the primary literature (not by asking Villanova faculty or students for examples, and not by asking colleagues at work for examples). Each student must meet with me by March 26th, at the absolute latest, to seek approval for the paper proposed for the student. If the paper does not contain original raw data (which is likely), I will generate a data set from the information presented in the paper (within 1 week of the meeting). The student will be required to apply the appropriate statistical test to the data set and to write an abstract (due April 23rd) for a 15-minute in-class oral presentation. The oral presentation will provide a brief overview of the research question being addressed, a description of the statistical treatment applied by the authors (if any) and why it is inappropriate, an explanation of why your statistical treatment is more appropriate, a presentation of your statistical results and their interpretation, and a summary that explains the extent to which your interpretations and conclusions are similar or different to what the original authors reported.

The final take-home examination will be distributed on May 2nd, and will be due by 5:00 PM on May 7th.

Academic Integrity: Students will conduct all work completely independently, without consultation with other students, faculty, colleagues, or anyone else. Questions about difficulties with assignments should be directed me. I can be reached by phone (610-519-4856; leave a voice message), email (Kelman.Wieder@Villanova.edu), or by stopping by my office (Mendel 131A) or my laboratory (Mendel G10/G12). Should questions or concerns about academic integrity with respect to you or to other students in the class arise, they should be directed to me immediately.