Instructor: Dr. Roger Woodard  
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Course Goal: This course is intended to give students a background in the methods of statistical analysis that will assist them in analysis of data generated from research situations in the biological sciences. Concentration in this course will be on realistic examples and the problems that arise in them.  

Required Texts: *An Introduction to Statistical Methods and Data Analysis* by R. Lyman Ott and Michael T. Longnecker. Duxbury Press 7th edition. Cost is approximately $200 new but used copies may be available.  

Calculator: Students will need a basic calculator that can do addition, subtraction, multiplication, division and square roots. Students are allowed but not required to use a more advanced statistics specific calculator such as a TI-83 or TI-84 calculator.  

Software: Students in this course will use SAS statistical software. This software is widely used in analysis of research data. This software may be accessed:  

1. Students may install the software on their own machine for free. For information on obtaining SAS for your own machine see [https://software.ncsu.edu/campus/sas/](https://software.ncsu.edu/campus/sas/)  
2. Students may also use SAS on the Virtual Computing Laboratory (VCL). Machines in the VCL are assigned on a reservation basis and may fill up. Students should plan accordingly to insure assignments are completed on time. There is no cost for using the VCL. For more information see [http://vcl.ncsu.edu/](http://vcl.ncsu.edu/)  
3. Students who are on campus can use SAS at a variety of campus laboratories.  

Students with disabilities: Reasonable accommodations will be made for students with verifiable disabilities. Any student who feels they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss your specific needs. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653. [http://www.ncsu.edu/provost/offices/affirm_action/dss/](http://www.ncsu.edu/provost/offices/affirm_action/dss/) For more information on NC State's policy on working with students with disabilities, please see [http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.1.php](http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.1.php)  

Communication: Students are expected to check their NCSU email regularly to receive course announcements. Students who do not use their NCSU email should arrange to have this email forwarded to an account they do use. Due to university regulations the instructor can send course announcements only to NCSU email addresses.
**Support mechanisms:** Since this course is online the instructor will have virtual office hours. Students who can not attend the posted times may make an appointment via email for other times. Additionally, the course TA will have virtual office hours during posted times. Finally, a general discussion board on the course website will allow students to ask questions of each other.

**Course Content:** Students in this course do not attend a typical class period. Instead students will receive course content through online presentations and activities. Students should set aside sufficient time in their schedules to complete these materials.

**Grades:** It is the student's responsibility to be aware of their grades in the course and the appropriate level of work required. Your final grade in this course will depend on the following:

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Midterm Exam (100 points each)</td>
<td>100</td>
</tr>
<tr>
<td>10 Online Quizzes (10 points each)</td>
<td>100</td>
</tr>
<tr>
<td>10 Computing Assignments (10 points each)</td>
<td>100</td>
</tr>
<tr>
<td>Comprehensive Final Exam</td>
<td>200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>500</strong></td>
</tr>
</tbody>
</table>

Grades will be determined by calculating the student's total out of the available points and comparing with a predetermined cutoff point scale as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>&lt;60%</td>
</tr>
<tr>
<td>D</td>
<td>60%-69%</td>
</tr>
<tr>
<td>C</td>
<td>70%-75%</td>
</tr>
<tr>
<td>C+</td>
<td>75%-80%</td>
</tr>
<tr>
<td>B-</td>
<td>80%-83%</td>
</tr>
<tr>
<td>B</td>
<td>83%-87%</td>
</tr>
<tr>
<td>B+</td>
<td>87%-89%</td>
</tr>
<tr>
<td>A-</td>
<td>90%-92%</td>
</tr>
<tr>
<td>A</td>
<td>93%-97%</td>
</tr>
<tr>
<td>A+</td>
<td>&gt;97%</td>
</tr>
</tbody>
</table>

Incomplete (IN) grades are given only as specified in university regulations. Students who wish to audit the course with satisfactory status must register officially for the course and will be required to complete all online quizzes.

**Quizzes:** Throughout the session there will be 11 online quizzes. Students will be graded on the best 10 of these 11. These online quizzes will help students insure that they have mastered the material. Each quiz will be tied to course content modules posted to the course website. Students should work through the modules before attempting these quizzes. Quizzes are presented in Moodle and are taken online. There is NO time limit on quizzes. Students will have two attempts for each quiz and the score will be the average of the two attempts.

**Exams:** All exams are closed book. For the midterm exam, students may use one 8 1/2 X 11 page of notes (front and back). For the final exam, students may use two 8 1/2 X 11 pages of notes (front and back). Calculators may be used on all exams. Students who are unable to attend an exam for a legitimate unavoidable reason may take a make-up exam only if the student provides suitable documentation of the delay and take the make-up in a timely manner. Students
may take the exam on any of the two days listed in the course outline below. The midterm exam is limited to 1.5 hours. The final exam is limited to 3 hours.

**Exam proctoring:** Students must arrange to take their exams during the assigned three day window. Students may take exams in their choice of two possible methods.

- Through the Distance Education Proctoring Offices. Students who are in Wake and adjoining counties may arrange to take their exams at the DE Proctoring offices on a walk in basis. For more information see

  [https://online-distance.ncsu.edu/current_students/testing-services/testing-services-on-campus/](https://online-distance.ncsu.edu/current_students/testing-services/testing-services-on-campus/)

- Off campus proctoring. Students who are not in Wake County or the adjoining counties or have extenuating circumstances may take exams through an approved proctor. All remote proctoring should be arranged through the Distance Education Proctoring Office. For more information on arranging proctors see

  [https://online-distance.ncsu.edu/current_students/testing-services/testing-services-remote/](https://online-distance.ncsu.edu/current_students/testing-services/testing-services-remote/)

Regardless of the location, students should plan their exam location well in advance and verify arrangements at least one week in advance of the exam.

**Computing Lab Assignments:** Analysis of real statistical data is accomplished using software. In this course you will be asked to complete ten computing assignments using SAS software. These assignments will ask you to conduct a data analysis and write a short report on the results. As part of the computing assignments students in this course will be broken into small groups of 3 to 5 students. These discussion questions will be keyed to the specific weeks data analysis assignment and will have specific due dates. Due dates are firm and your fellow group members will be counting on your contributions to be submitted by the due date. These assignments will be posted to the course website. Computer failures, lost files and other technical difficulties are not valid excuses for submitting an assignment late. Discussion postings will be graded based on quality of responses. Students are expected to treat each other with respect on the boards.

**Academic Misconduct:** Cheating, plagiarism and other forms of academic dishonesty will not be tolerated. To create a fair and equitable environment, the instructor aggressively enforces the universities policies on academic misconduct. All exams are to be completed individually. Although working together on programming assignments to overcome obstacles is encouraged, each student must compose and write their own analysis and reports. All cases of academic misconduct will be handled as set out in university policies. For additional information see:

[https://studentconduct.dasa.ncsu.edu/students/student-conduct-policies/](https://studentconduct.dasa.ncsu.edu/students/student-conduct-policies/)
Course Outline:
Review of statistical inference
Simple Linear Regression
Matrix operations
Multiple Regression
Analysis of Variance
Contrasts and multiple comparisons
Factorial Designs
Random effects
Analysis of Covariance
Logistic Regression

Calendar of Events:

January 16 Holiday (Martin Luther King, Jr. Day)

February 27 through March 1 – Midterm Exam
March 6 to March 10 – Spring break.
April 14 – Spring Holiday
May 1 through May 3 – Final exam