Course Description: The application, interpretation, and critique of statistical methods for analyzing arrays of species-by-samples data as arise in biological monitoring of environmental impacts and fundamental studies of community ecology. Topics include standard diversity indices; hierarchical clustering; multidimensional scaling (MDS); principal components analyses (PCA); Analysis of similarities (ANOSIM); PERMANOVA, relating community structure to physiochemical parameters; and selected advanced topics. This course will emphasize the use of statistical software packages and reporting of results.

Textbooks:


Student learning outcomes: Students will learn how to 1) analyze datasets using the PRIMER software package; 2) apply and understand statistical terminology; 3) interpret statistical results; and 4) write up experimental statistical methods and results sections in the format of a biological sciences journal article.

Course objectives met by students: To facilitate the acquisition of information, students should preview the lecture content as indicated in the lecture outline below prior to each lecture meeting. Students are expected to apply acquired knowledge to correctly suggest statistical analyses strategies for common experimental design scenarios.
Important dates:

- September 3: Labor Day Holiday
- November 14: Deadline to withdraw with a "W"
- November 22-24: Thanksgiving Holiday
- Dec 7-13: Final Exams

Grading Policies: UTRGV’s grading policy is to use straight letter grades (A, B, C, D, or F). Homework and projects will include problems to be turned in for grading, and will often require computer analysis. You may cooperate with one another to learn how to use computers and software, but I will expect to see reports that annotate and interpret computer output in your own words. A 10% deduction will be accrued daily for all late homework and projects. A maximum of 3 corrected assignments can be turned in to receive full credit if done so by the next class meeting. Corrected assignments turned in after the next class meeting will not be considered.

Homework: 20%
Projects: 60%
Assigned readings: 10%
Final Practical: 10%

For Assigned readings, please answer the following questions: 1) what PRIMER routines were employed; and 2) what research questions were addressed with PRIMER.

Lecture Topic Outline:

Changes (manual), Chapters 1-2 (4), 9 (3), 10 (8), 3 (5) , 5 (7), 4 (10), ANOSIM 6 (12), SIMPER 7 (12), Biota-Environmental 11(11), LINKTREE (11), RELATE 15 (13).
- Introduction / working with data
- Factors (and Indicators), identifying sample (and species) groups
- Pre-treatment options
- Resemblance
- Hierarchical clustering
- Multi-dimensional scaling
- Analyzing environmental variables
- Linking assemblage and environmental data
- Analysis of similarities and species contributions
- Biodiversity indices and species curves
- PERMANOVA
- PERMDISP

Computing: We will use the PRIMER-E multivariate statistical program for ecologists (version 7). Visit http://www.primer-e.com/

Attendance: Students are expected to attend all lecture periods and attendance will be taken.

STUDENTS WITH DISABILITIES: If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is
recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. **Brownsville Campus:** Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu. **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

**MANDATORY COURSE EVALUATION PERIOD:**
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Online evaluations will be available Nov. 18 – Dec. 9, 2015. Students who complete their evaluations will have priority access to their grades.

**ATTENDANCE:**
Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

**SCHOLASTIC INTEGRITY:**
As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

**SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:**
In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

**COURSE DROPS:**
According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.