

**Tennessee Technological University  
Mathematics Department**

**MATH 6470: Environmental Statistics**

**I. COURSE DESCRIPTION FROM CATALOG:**

This course covers finite population parameter estimation, spatial sampling techniques, animal population size estimation, variogram estimation, kriging, logistic regression, and survival analysis. Lec. 3-3. Cr. 3-3.

**II. PREREQUISITE(S):**

B or better in MATH 6070 or MATH 6170 or consent of instructor

**III. COURSE OBJECTIVE(S):**

1. To introduce students to the most modern environmental sampling and estimation techniques.
2. To incorporate these statistical techniques in the analysis of their real-world research data.
3. To acquaint students with statistical computing packages.

**IV. STUDENT LEARNING OUTCOMES:**

Students in this course will

1. Understand the basic techniques of statistical environmental sampling and estimation to properly use in their major.
2. Learn the critical thinking skills necessary for the inference procedures of kriging, logistic regression, and survival analysis and the diagnostics involved.
3. Have a better appreciation of statistics as a field of study and the people who helped create that field.
4. Acquire self-learning skills by the virtue of the course material and the need for in-depth research to answer many of the problems.

**V. TOPICS TO BE COVERED:**

Topics to be covered include environmental sampling methods such as finite population sampling, simple random sampling, stratified sampling, quadrats, line transects, and spatial sampling. Estimation methods to be discussed include capture-recapture methods, kriging, diversity indices, logistic regression, survival analysis, and hazard rate functions.

**VI. POSSIBLE TEXTS AND REFERENCES:**

*Environmental Statistics: Methods and Applications*, by Vic Barnett, John Wiley & Sons (2004).  
*Environmental Statistics and Data Analysis*, by Wayne R. Ott, CRC Press (1995).  
*EnvStats: An R Package for Environmental Statistics*, by Steven P. Millard, Springer-Verlag (2013), 2<sup>nd</sup> Edition.  
*Statistics for Spatial Data*, by Noel Cressie, John Wiley & Sons (2015), Revised Edition.

**VII. ADDITIONAL INFORMATION:**

**VIII. STUDENT ACADEMIC MISCONDUCT POLICY**

Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the definitions of academic misconduct and policies and procedures for addressing Academic Misconduct at Tennessee Tech. For details, view the Tennessee Tech's Policy 217 – Student Academic Misconduct at [Policy Central](#).

**XI. DISABILITY ACCOMMODATION**

Students with a disability requiring accommodations should contact the Accessible Education Center (AEC). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The AEC is located in the Roaden University Center, Room 112; phone 931-372-6119. For details, view the Tennessee Tech's Policy 340 – [Services for Students with Disabilities at Policy Central](#).