Course Description

The objective of the course is to discuss applied statistics, particularly regression analysis and logit models, and apply these models to examples of social science and urban and regional analysis. The aim is to understand the techniques better through their use, to evaluate critically their use by others, and to learn to appreciate the subtle interplay of "scientific" methods and personal judgment in research and analysis. We will learn to make sense out of data through statistical analysis and to put the data in a format that people can understand. We will emphasize understanding why one method is used over another in different circumstances and the interpretation of the results from the computer. It is my expectation that the student will learn what method to use as well as why it is used, to interpret the inferential statistics and to "tell the story" of the dependent and independent variables.

We begin with introduction to research design, which includes an assignment whereby students prepare a research proposal, hopefully toward student’s dissertation, in which regression and/or logit analysis will be used. Students’ progress will be discussed every session till the due date of the research proposal. A brief review of statistics as a refresher will begin the statistics part of the course before moving on to linear regression. A multitude of topics under linear regression will be covered in depth, the purpose of which is to expose the student to many of the pitfalls one may encounter in conducting research and to become versed in regression applications and interpretation of results. It should also be noted that a brief review of important related statistical concepts will be discussed when the need arises. After a thorough treatment of bivariate and multivariate regression models we pay special attention to the case of the limited dependent variable. We often try to explain a phenomenon with only information on whether or not an event occurred or whether one of several possible events occurred. We will examine logit (and probit) models as methods to use in such occasions.

Since not everything is explainable by a single equation and that in some research the dependent variable may also play the part of an independent variable, multiple equation systems are often necessary. We will finally briefly explore Structural Equation Modeling (SEM) and multiple equation systems that include both two-stage least squares and path analysis. These models explore multivariate relationships in an integrated manner. Finally, on an ongoing basis, an introduction to the application of statistics in spatial modeling drawing on Geostatistical Analyst Tools and Spatial Statistics Tools will be discussed.
**Learning Outcomes**

By the end of this course, students should be able to:

- Understand the process of research design and how to prepare research proposal
- Understand and explain regression analysis and apply them in urban and regional analysis
- Evaluate and choose the appropriate techniques needed in urban and regional research
- Identify and explain bivariate and multivariate regression models
- Identify and explain logit and probit models and apply them in real world projects
- Identify and explain Structural Equation Modeling (SEM) and multiple equation systems.

**Required Textbooks and Other Course Materials**

There is no required textbook for the course, although the following textbooks are highly recommended. In addition to the useful chapters selected from the textbooks listed below, the instructor will make his presentation notes available to aid in the study and understanding of the readings throughout the semester in the course Blackboard at https://elearn.uta.edu/.


There are two highly recommended resources in addition to the textbooks mentioned above, which provide students with hands-on experience in statistical analysis using SPSS.


**Course Requirements**

- To attend the entire class session every week and to participate in class discussions and all activities. In-class activities and discussions are an integral part of our learning together.
- To complete all required readings, assignments, exercises, and examination.
• If you fail to submit your assignments or exercises on time due to an emergency, contact the instructor for the possibility of an extension.

**Description of Major Assignments and Examinations**

• Attendance and Class Participation

  Apart from the attendance required for every session, I expect active participation and careful reading of the assigned texts and respectful acknowledgement of views that may differ from yours.

• Assignments

  Students are required to complete two course assignments, being designed to help them to put together and test a useful model and interpret the results.

• Exercises

  During the semester, students are required to complete three course exercises, which have been prepared to help them put the knowledge and skills they have acquired into practice.

• Final Examination

  At the end of the semester a final exam is given to students to evaluate the understanding and critical thinking of students to identify and explain the reading materials discussed in the class. At the end of the semester, a prep-exam similar in nature to that of final exam is given to students to help them prepare for the final examination.

**Attendance**

At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students’ academic performance, which includes establishing course-specific policies on attendance. The attendance policy for this course requires regular class attendance from all students (If you must miss a class due to a conflict, please let the instructor know ahead of time). Students are responsible for all course information, content, and assignments that may be missed due to absence. The material is cumulative through the semester and missed material is necessary in subsequent meetings.

**Classroom Etiquette**

Please arrive at class on time or before the starting time. Your cell phone devices should be turned off if they cannot be set to a silent mode. Please be prepared for the class discussions. Please try to be pleasant and positive in your classroom behavior. Show respect for all class members. We can learn a great deal from each other, but this can only happen in a comfortable learning environment for everyone in the class. We have people from many different backgrounds in this class and people with many different levels of academic preparation. So please use a respectful and calm tone of voice all the time and avoid sarcasm, heavily judgmental or confrontational comments that will create an inhospitable classroom atmosphere.
Grading

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Grade Scale

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Course Calendar

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. – A. Anjomani
Week 1 - January 21

**Introduction to the Course and Explain the Expectations and Requirements**

Instructor’s PPT 1 — Introduction to the Course

Week 2 - January 28

**Introduction to Research Design**

Instructor’s PPT 2 — Introduction to Research Design

**Required readings:**


**Recommended readings:**


Assignment 1 – Part 1 – Conceptualizing a Research (Due February 25th)

Week 3 – February 04

**Review of Statistics | Intro to Geo/Spatial Stat Tools**

Instructor’s PPT 3 — Review of Fundamental Concepts (Part I)

Discussion of Students’ Research Design Progress

**Required readings:**


Week 4 - February 11

**Review of Statistics | Geo/Spatial Stat Tools**
- Instructor’s PPT 4 — Review of Fundamental Concepts (Part II)
- Discussion of Students’ Research Design Progress

**Required readings:**

Week 5 - February 18

**Correlation and Regression | Geo/Spatial Stat Tools**
- Instructor’s PPT 5 — Correlation and Regression
- Discussion of Students’ Research Design Progress

**Required readings:**

**Recommended readings:**

Week 6 - February 25

**Regression Analysis | Geo/Spatial Stat Tools**
- Instructor’s PPT 6 — Regression Analysis
- Discussion of Students’ Research Design Progress

**Required readings:**

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*Assignment 1 – Part 2 – Regression Analysis (Due March 31th)*
Week 7 - March 03

**Required readings:**


**Recommended readings:**


**Application Example: (Presentation time permitting)**


Submission of Assignment 1 – Part 1 – Conceptualizing a Research

Week 8 – March 10

**Required readings:**


**Application Example: (Presentation time permitting)**

March 17 – Spring Break

Week 9 - March 24

Multiple Regression with Dummy Variables  |  Geo/Spatial Stat Tools
Instructor’s PPT 9 — Dummy Variables and Residual Analysis

Required readings:


Application Example: (Presentation time permitting)


Week 10 - March 31

Multiple Regression and Model Building  |  Geo/Spatial Stat Tools
Instructor’s PPT 10 — Interactions and Model Building

Required readings:


Week 11 - April 07

Logistic Regression  |  Geo/Spatial Stat Tools
Instructor’s PPT 10 — Introduction to Logistic Regression and Logit Models

Required readings:


**Recommended readings:**


**Application Example: (Presentation time permitting)**


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**Submission of Assignment 1 – Part 2 – Regression Analysis**

- **Week 12 - April 14**

  **Logistic Regression | Geo/Spatial Stat Tools**

  **Instructor’s PPT 12 — Interpretation and Application of Logistic Regression**

**Required readings:**


**Application Example: (Presentation time permitting)**

Week 13- April 21

**Logistic Regression | Geo/Spatial Stat Tools**

**Instructor’s PPT 13 — Multinomial and Nested Logit models**

**Required readings:**


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**Assignment 2 – Logistic Regression Assignment (Due May 4th)**

Week 14 – April 28

**Systems of Equations | Geo/Spatial Stat Tools**

**Instructor’s PPT 14 — Systems of Equations/ Structural Equations Modeling [SEM]**

**Required readings:**


**Application Example: (Presentation time permitting)**

Course Review and Wrap-up Discussions

Submission of Assignment 2 – Logistic Regression

Final Examination will be made available online through Blackboard on May 06 and the due date is May 13, 11:59 pm.
Drop Policy

Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships ([http://uta.edu/aaao/fao/](http://uta.edu/aaao/fao/)).

Americans with Disabilities Act

UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA), and Section 504 of the Rehabilitation Act. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the Office for Students with Disabilities (OSD). Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting: **The Office for Students with Disabilities, (OSD)  [www.uta.edu/disability](http://uta.edu/disability) or calling 817-272-3364.**

**Counseling and Psychological Services, (CAPS)  [www.uta.edu/caps](http://www.uta.edu/caps/) or calling 817-272-3671.**

Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability) or by calling the Office for Students with Disabilities at (817) 272-3364.

Title IX

The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit [uta.edu/eos](http://uta.edu/eos). For information regarding Title IX, visit [www.uta.edu/titleIX](http://www.uta.edu/titleIX).

Academic Integrity

Students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

*I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*

*I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*
UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System Regents’ Rule 50101, §2.2, suspected violations of university’s standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student’s suspension or expulsion from the University.

Electronic Communication

UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

Student Feedback Survey

At the end of each term, students enrolled in classes categorized as “lecture,” “seminar,” or “laboratory” shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit http://www.uta.edu/sfs.

Final Review Week

A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week unless specified in the class syllabus. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures

Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located up the stairs. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.