GEOG 5113-221: Quantitative Methods in Geographical Research

Course Description:

Statistics are a pervasive part of our lives. Market reports, opinion polls, political analysis, and environmental and economic reports all use (and misuse) statistics and statistical data. Professionally, statistics is very widely used in research and is almost indispensable for summarizing, characterizing, revealing, and understanding hidden patterns and relationships in data. Therefore, understanding basic statistical concepts is important, even necessary, in helping make sense of our modern world. This course will help you develop or improve your statistical literacy by emphasizing concepts and critical thinking over computation. Emphasis will be placed on the logic of the scientific method and how to analyze data to identify patterns and draw valid conclusions.

Class Dates, Location and Hours:

Dates: November 13 – 18, 2018
Location: SHAPE, Belgium. See Site Director for classroom location.
Hours: Tuesday - Friday 6:00-9:30 pm; Saturday and Sunday 8:30 a.m.-4:30 p.m.
Last day to enroll or drop without penalty: October 15, 2018

Site Director:

Email: apshape@ou.edu. Phone: 065-44-3654; DSN 423-3654.

Professor Contact Information:

Course Professor: Bruce Hoagland, Ph.D
Mailing Address: Department of Geography
                        University of Oklahoma
                        100 E. Boyd St., Suite 684
                        Norman, OK 73019
Telephone Number: (405) 325-0562
Email Address: bhoagland@ou.edu
Professor availability: The professor will be available via email to students before and after the class sessions. On-site office hours are half an hour before and after each class session, by appointment.

Textbook(s) and Instructional Materials:

Student materials are available at the OU Follett Bookstore located at 1185 Asp Avenue; Norman, OK, and can be ordered online, by phone, by email, or by fax. Ordering online at http://www.bkstr.com/oklahomastore/home is strongly recommended – students can track the status of their order within 48 hours. If an order has not been shipped within three days, students can contact the Follett textbook manager by phone (405) 325-3511, (800) 522-0772 (toll-free) or email 0831mgr@fheg.follett.com. Phone orders (ask for the textbook manager and identify yourself as an Advanced Programs student) can be placed 8 a.m. to 6 p.m. Monday through Thursday; 8 a.m. to 5 p.m. on Friday; 10 a.m. to 4p.m. on Saturday (CST). Summer hours: 9 a.m. to 5 p.m. Monday through Friday (CST). Fax orders can be placed 24 hours a day at (405) 325-7770. Text prices are available online.

1. Bennet, J. O., Briggs, W., & Triola, M.F. (2017) *Statistical reasoning for everyday life* (5th ed.). Boston, MA: Addison-Wesley Longman ISBN 9780321286727

Note: Follett is the Advanced Programs contractual textbook provider. Should text changes become necessary after publication of the course syllabus, Advanced Programs will facilitate text returns/refunds only for texts purchased through Follett.

Course Objectives:

The objective of this course is to gain an understanding of statistical principles and their application. We will learn how to collect data, summarize data, examine data for patterns and relationships, and analyze data so we can draw meaningful conclusions. We will also learn how to interpret and judge statistical information, including information embedded in computer output, information reported in the popular press or information contained in published research. We will use the software that is available through Pearson.

Course Outline:

I. Understanding Data and the Research Process
       a. Types of Statistical Studies
       b. Sampling
       c. Data Types and Measurements
II. Describing Data
       a. Picturing Distributions
       b. Shapes of Distributions
       c. Measures of Variation
       d. Normality and the Central Limit Theorem
III. Understanding Relationships
       a. Variables, Relationships, Measurement, Reliability, and Validity
       b. Correlation and Causation
IV. Statistical Inference
       a. From Samples to Populations
       b. Hypothesis Testing
V. Other topics, including practical uses of statistics, may be covered if time permits.

Assignments, Grading and Due Dates:

The course format consists of traditional lectures and group discussion. Grading will consist of the following components.

1. Pre and post course assignments constitute 40% of your grade.
2. Participation: thoughtful participation throughout the course will help solidify your learning, as well as adding to the educational environment: 10% of your course grade.
3. A final examination will be given in class on the last day. This will be based on material covered during the class discussions and may also require elaboration or extension of these materials and ideas. This will be worth 50% of your grade.

Pre-seminar assignment

1. The pre-seminar assignment is to locate an article from the popular literature (e.g., newspaper, magazine, Internet) that uses statistics. Write up a brief description (two pages) of the use of statistics in the article. Explain what how the authors describe the data and methods and how they interpret results. Consider the following questions: Do the authors do a good job of explaining what is involved? Do the conclusions follow from the information given? Do you consider this a good use or a bad use of statistics? What additional information would you like to have? Be prepared to discuss the article and its use of statistics on the first night of class. Essay length: 1,000 words. **Due date: November 12, 2018**
2. Data collection: Go to a public place (BX, restaurant, the office, wherever), find a comfortable spot, and record the following information for each person that passes by over a 15 minute period; hair color, gender, do they wear glasses. In addition, visit a weather web site and download/record the hourly

temperature for a location of your choosing for a 24-hour period. We will discuss the first night of class how these data will be used.
3. Complete the problems listed below using the Pearson software accessible with your textbook Problems to complete (Submit the answers in the Canvas drop box as a docx file.
    a. Chapter 1: Speaking of Statistics 1. Chapter Review exercise 3.
    b. Chapter 2: Measurement in Statistics 2. Chapter Review exercise 2.
    c. Chapter 3: Visual Displays of Data 3. Chapter Review exercise 1.
    d. Chapter 4: Describing Data 4. Chapter Review exercise 1. (do not include the box plot).
    e. Chapter 5: A Normal World 5. Chapter Review exercise 2.
    f. Chapter 6: Probability in Statistics. Chapter Review exercise 1-6.
    g. Chapter 7: Correlation and Causality. Chapter Review exercise 1-4.
    h. Chapter 8: From Samples to Populations. Chapter Review exercise 3 (a-d).
    i. Chapter 9: Hypothesis Testing. Chapter Review exercise 1 (a-i).
    j. Chapter 10: t Tests, Two-Way Tables, and ANOVA. Chapter Review exercise 4 (a-d).

Post-seminar assignment

Revisit the article from the pre-seminar assignment and assess it based upon what you have learned in class. Find three additional articles on a topic related to the pre-seminar article and assess whether the authors present a compelling case for their hypothesis based on the criteria above and review how they present a more affective use if the data and results. Essay length: 2,000 words **Due date: November 24, 2018**

Grading:

This is a letter-graded course: A, B, C, D, or F.

Notice: Failure to meet assignment due dates could result in a grade of I (Incomplete) and may adversely impact Tuition Assistance and/or Financial Aid.

POLICIES AND NOTICES

Attendance/Grade Policy

Attendance and participation in interaction, individual assignments, group exercises, simulations, role playing, etc. are valuable aspects of any course because much of the learning comes from discussions in class with other students. It is expected that you attend all classes and be on time except for excused emergencies.

Excused absences are given for professor mandated activities or legally required activities such as emergencies or military assignments. It is the policy of the University to excuse absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required class work that may fall on religious holidays. Unavoidable personal emergencies, including (but not limited to) serious illness; delays in getting to class because of accidents, etc.; deaths and funerals, and hazardous road conditions will be excused.

If you are obtaining financial assistance (TA, STAP, FA, VA, Scholarship, etc.) to pay all or part of your tuition cost, you must follow your funding agency/institution's policy regarding "I" (Incomplete) grades unless the timeline is longer than what the University policy allows then you must adhere to the University policy. Students who receive Financial Aid must resolve/complete any "I" (Incomplete) grades by the end of the term or he/she may be placed on "financial aid probation." If the "I" grade is not resolved/completed by the end of the following term, the student's Financial Aid may be suspended make the student ineligible for further Financial Aid.

Students are responsible for meeting the guidelines of Tuition Assistance and Veterans Assistance. See the education counselor at your local education center for a complete description of your TA or VA requirements.

Academic Integrity and Student Conduct

Academic integrity means honesty and responsibility in scholarship. Academic assignments exist to help students learn; grades exist to show how fully this goal is attained. Therefore all work and all grades should result from the student's own understanding and effort.

Academic misconduct is any act which improperly affects the evaluation of a student's academic performance or achievement. Misconduct occurs when the student either knows or reasonably should know that the act constitutes misconduct. Academic misconduct includes: cheating and using unauthorized materials on examinations and other assignments; improper collaboration, submitting the same assignment for different classes (self-plagiarism); fabrication, forgery, alteration of documents, lying, etc…in order to obtain an academic advantage; assisting others in academic misconduct; attempting to commit academic misconduct; destruction of property, hacking, etc…; intimidation and interference with integrity process; and plagiarism. All students should review the Student's Guide to Academic Integrity at http://integrity.ou.edu/students_guide.html

Students and faculty each have responsibility for maintaining an appropriate learning environment. All students should review policies regarding student conduct at http://studentconduct.ou.edu/

Accommodation Statement

The University of Oklahoma is committed to making its activities as accessible as possible. For accommodations on the basis of disability, please contact your local OU Site Director.

Adjustment for Pregnancy/Childbirth-Related Issues

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact me as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to accommodations based on temporary disability. Please see http://www.ou.edu/content/eoo/faqs/pregnancy-faqs.html.

Title IX Resources

For any concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University offers a variety of resources, including advocates on-call 24/7, counseling services, mutual no-contact orders, scheduling adjustments, and disciplinary sanctions against the perpetrator. Please contact the Sexual Misconduct Office at smo@ou.edu or (405) 325-2215 (8-5), or the Sexual Assault Response Team at (405) 615 -0013 (24/7) to report an incident. To learn more about Title IX, please visit the Institutional Equity Office's website at http://www.ou.edu/content/eoo.html

Course Policies

Advanced Programs policy is to order books in paperback if available. Courses, dates, and professors are subject to change. Please check with your OU Site Director. Students should retain a copy of any assignments that are mailed to the professor for the course. Advanced Programs does not provide duplicating services or office supplies.

Any and all course materials, syllabus, lessons, lectures, etc. are the property of professor teaching the course and the Board of Regents of the University of Oklahoma and are protected under applicable copyright.

For more information about Advanced Programs, visit our website at: http://www.goou.ou.edu/

<p style="text-align: center;">**INSTRUCTOR VITA**</p>

<p style="text-align: center;">**Bruce W. Hoagland, Ph. D.**</p>

Education

- 1995   Ph.D., Botany; University of Oklahoma; Norman
- 1990   M.S., Ecology; Eastern Kentucky University; Richmond
- 1986   B.A., Biology; University of Louisville; Louisville, Kentucky.

Current Positions

- Professor of Geography
- Coordinator, Oklahoma Natural Heritage Inventory
- Adjunct Professor of Botany

Frequently Taught Advanced Programs Courses

GEOG 5113-220   Quantitative Methods in Geographical Research
GEOG 6240-221   Seminar in Resource and Environmental Geography: Biogeography and Conservation

Major Areas of Teaching and Research Interest

- Geography and conservation of vascular plants.
- Current research projects include use of 19th century land surveys to analyze land cover change, inventories of Oklahoma vascular plants, and phenology of trees in the Talamanca Mountains, Costa Rica.
- Biogeography
- Vegetation Ecology
- Geography of Oklahoma
- Graduate seminars in vegetation analysis.

Sample Publications

- Crawford, PH & BW Hoagland. 2010. Using species distribution models to guide conservation at the state level: the endangered American burying beetle (*Nicrophorus americanus*) in Oklahoma. *Journal of Insect Conservation* 14:511-521.
- Hoagland BW, Buthod A, Callahan-Crawford P, Elisens W, and Tyrl R. 2009. Oklahoma Vascular Plants Database. [online]. Available: www.oklahomaplantdatabase.org/
- Micozzi, M & BW Hoagland. 2010. Vegetation dynamics in a semi-arid mesa environment: the effects of spatial heterogeneity and environmental gradients at Black Mesa, Cimarron County, Oklahoma. Black Mesa, Cimarron County, Oklahoma. VDM Verlag-Muller. 120 pp.
- Hoagland BW. 2006. Arkansas and Red River Basins; Soils; Vegetation; Threatened and Endangered Species; The Louisiana Purchase; American Explorers 1806-1821; American Explorers 1832-1853; Buffalo Country; Township and Range Survey System; Wheat Farming 1907-2000; Cotton Farming 1907-2000; Corn and Other Grain Farming 1907-2000 (individual entries), in CR Goins & D. Goble, Historical Atlas of Oklahoma. University of Oklahoma Press, Norman.

Major Professional Affiliations

- Association of American Geographers
- Botanical Society of America