

College of Continuing Education

The University of Oklahoma

Advanced Programs

Course Title: Quantitative Methods in Geographical Research

Course Number: GEOG 5113-220

Course Description: As in many fields of scientific research, investigations into geographic phenomena require individuals to practice their skills of observing, defining, classifying, analyzing, inferring, reasoning, and integrating a wide variety of data and facts to solve a problem or answer a given question. Over the past few decades, geographic information systems (GIS) and related technologies have emerged as a means to efficiently and effectively access a range of analytical and quantitative methods to facilitate investigations of basic scientific questions concerning geographic phenomena. Nowadays, the scope and complexity of questions that GIS is capable of addressing has expanded dramatically to support a wide variety of uses and investigations relevant to government agencies, private businesses, citizens groups, and research institutions. A few examples include near real-time analysis of emergencies, applications in military intelligence and operations, homeland security, defense planning and operations, facilities siting, environmental impact assessment, logistics, and many others. The course is designed to introduce students to the fundamental concepts, capabilities and applications of GIS technology, with emphasis on spatial statistical methods and their applications to real world problems.

Class Dates, Location, and Hours: February 20-25, 2007 - Ramstein, Germany. Classes held at Bldg. 2783, 3rd Floor, Kapaun Air Station. Class Hours: Tue-Fri 6:00-9:30 p.m.; Sat-Sun 8:30 a.m.-4:30 p.m.

Last Day to Enroll or Drop Without Penalty: PLEASE ENTER NEW DATE

Site Manager: Nate Adams. Field Assistants: Annette Thorpe & Tasha Everett. Phone: DSN 480-6807, Civilian 06371-476807; Fax: 06371-479839; E-mail: apramstein@ou.edu

Course Professor: Tarek Rashed, Ph.D.

Mailing Address: Department of Geography, SEC 684
University of Oklahoma
Norman OK 73019, USA

Telephone Number: 405 325 5104

Fax Number: 405 325 6090

E-mail Address: rashed@ou.edu

Professor availability: The professor will be available via e-mail to students before and after the class sessions. On-site office hours are half an hour before and after each class session, or by appointment.

Textbook(s) and Instructional Materials:

Student materials are available at the Follett/AP Bookstore at www.oklahomaunion.bkstr.com. Orders may also be placed by telephone at 866-369-9713 (toll free in the U.S.) or 405-325-5960 (outside the U.S.). E-mail orders may be sent to oklahomaunion@bkstr.com. Representatives are available from 8 a.m. to 6 p.m. CST Monday through Thursday and 8 a.m. to 5 p.m. CST on Friday. Faxed orders may be placed 24 hours a day to 866-223-5607 (toll free in the U.S.) or 405-325-1557 (outside the U.S.).

01 Lee, J. & Wong, D.W.S. (2005). Statistical analysis of geographic information with ArcView GIS and ArcGIS. ISBN 0471468991. (Text prices are available online.)

Note: The Follett/AP Bookstore 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 the Follett/AP Bookstore.

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

Course Objectives:

The principal objective of this course is to help you gain an understanding of basic GIS concepts, its analytical power, and the variety of its application to real world problem involving geographic information; specific objectives are to enable you to:

- understand the technical language of GIS
- differentiate statistical analysis of geospatial data from statistical analysis of non-spatial data
- differentiate between exploratory and confirmatory geospatial data analysis
- learn how to test hypotheses about the nature of spatial pattern, dependency, and heterogeneity.

Course Outline:

Note: You are highly encouraged to bring to class your laptop with ArcView installed

Mondy – Introduction to GIS and the Nature of Spatial Data

Tuesday – Solving problems with GIS I

Wednesday – Solving Problems with GIS II

Thursday – Classical Statistics

Friday – Introduction to Spatial Statistics

Saturday – Exploratory Spatial Data Analysis

Sunday – Confirmatory Spatial Data Analysis

Assignments, Grading, and Due Dates:

The learning experience should be collective and based on a completion of the pre-seminar assignment and discussions of chapters in the assigned book and issues raised during the exercises presented in the class. The latter means that you'll need to arrive to class ready to ask questions and engage in active discussions.

1. Pre-seminar assignment (40%): You will need to complete an online, self-study training course "Introduction to ArcView 3.x." This **18 hours** course will introduce you to a range of spatial analysis tools, and teach you how to create, display, and manipulate geographic data. Topics covered in the training can be viewed at this link:

http://training.esri.com/acb2000/showdetl.cfm?DID=6&Product_ID=566

Please read carefully the instructions below if you plan to enroll in the class:

- a. On 11 January 2008, the instructor will email codes to all the enrolled in the class to access the course for free.
- b. **The code will be sent to your OU email address.**
- c. If you have a different email address or have enrolled in the class after 11 Jan 2008, you will need to email the instructor at rashed@ou.edu and request a code sent to you on a specified address
- d. Once you receive the code, you will need to create an online account in ESRI from the following link
<http://training.esri.com/gateway/index.cfm?fa=login.loginForm>
- e. Once you created an account, use the user name and password information to logon ESRI virtual campus

- f. Go to “My Training” and click on “My Virtual Campus Courses”
- g. Select “Start a New Course” and enter the code you received in your email
- h. The course “Introduction to ArcView 3.x” should be listed now under “My Virtual Campus Courses”
- i. The course comes with a free download of ArcView GIS, please read the system requirements and make sure your system meets these requirements.
- j. Allow for the completion of this course a minimal of 18 hours.
- k. Upon completion of this course, you will need to pass an online exam to receive a certificate of completion of the self-study training. You will need to print out this certificate and bring a copy with you on the first day of the class as a proof of completing the pre-class assignment.

Each day delay in submitting the certificate of completion will entitle you to a discount of 10% off the overall grade assigned to the pre-seminar assignment. That is, 2nd day submission = 90 points, 3rd day submission = 80 points, and so on. THE INSTRUCTOR SHALL NOT ACCEPT EXCUSES UNDER ANY CIRCUMSTANCES.

2. Participation (15%), as expressed in the form of class discussion and engagement in the exercises offered.
3. A final exam (15%), will be given on the last day of class. The exam will be based on the exercises and materials covered during the class and how you can extend them to real world problems.
4. Post-seminar assignment (30%). This will include a set of selected exercises assigned by the instructor in the last day of class and based on the CD that comes with the book. You will be given two weeks to complete and email this assignment to the instructor on or before Friday 17 March 2008.

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

ATTENDANCE/GRADE POLICY NOTICE

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. 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.

Government regulations for completing coursework frequently differ from university requirements. **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 HONESTY

Honesty is a fundamental precept in all academic activities and ... [you] have a special obligation to observe the highest standards of honesty. Academic misconduct in any form is inimical to the purposes and functions of the University and is therefore unacceptable and is rigorously proscribed. Academic misconduct includes:

- a) cheating (using unauthorized materials, information, or study aids in any academic exercise), plagiarism, falsification of records, unauthorized possession of examinations, intimidation, and any and all other actions that may improperly affect the evaluation of a student's academic performance or achievement;
- b) assisting others in any such act;
- c) or attempting to engage in such acts.

All acts of academic misconduct will be reported and adjudicated as prescribed by the [Student Code](#) of the [University of Oklahoma](#).

Please see OU website for details concerning OU Academic Honesty policy set forth by the Honor Council. www.ou.edu/honorcouncil.

ACCOMMODATION STATEMENT

The [College of Continuing Education](#) [Advanced Programs] is committed to making its activities as accessible as possible. The College and the University provide a range of special services for those with disabilities. If you anticipate a need for some of these services, please contact your OU Site Manager.

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 Manager. Students should retain a copy of any assignments that are mailed to the professor for the course.

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Tarek Rashed, Ph.D.

EDUCATION

Ph.D. (2003) Geography, UC Santa Barbara and San Diego State University, USA
Post Graduate Diploma (2000) Disaster Management, University of Geneva, SWITZERLAND
M.S. (1998) Computation, University of Manchester (UMIST), UK
B.S. (1993) Architectural Engineering, University of Assiut, EGYPT

CURRENT POSITION

Advanced Programs Professor since 2004
Assistant Professor, Department of Geography, University of Oklahoma

FREQUENTLY TAUGHT ADVANCED PROGRAMS COURSES

GEOG 6240 Seminar in Resource & Environmental Geography
GEOG 6230 Seminar in Economic Geography

MAJOR AREAS OF TEACHING AND RESEARCH INTEREST

GIS systems analysis and design, spatial decision support systems; Urban remote sensing; Applications of geospatial techniques to modeling vulnerability and risks to urban hazards and associated population dynamics.

REPRESENTATIVE PUBLICATIONS AND PRESENTATIONS

- Rashed, T., 2005. Sustainable Hazards Mitigation in Cities and the Role of GIS and Remote Sensing Technologies. In M. Campagna, editor, *GIS for Sustainable Development: Bringing Geographic Information Science into practice towards sustainability*, Taylor & Francis (forthcoming)
- Juergens, C. and Rashed, T. (editors), 2005. *Remote Sensing of Urban and Suburban Areas*. Kluwer Academic Publishers (forthcoming).
- Weeks, J., Getis, A., Hill, A., Gadalla, M., and Rashed, T., 2004. The Fertility Transition in Egypt: Intra-Urban Patterns in Cairo. *Annals of the Association of American Geographers*, 94 (1): 74:93.
- Rashed, T., Weeks, J., Stow, D., and Fugate, D. 2004. Measuring Temporal Compositions of Urban Morphology through Spectral Mixture Analysis: Toward a Soft Approach to Change Analysis in Crowded Cities. *International Journal of Remote Sensing*, (forthcoming).
- Rashed, T., Weeks, J., Roberts, D., Rogan, J., and Powell, R. 2003. Measuring the Physical Compositions of Urban Morphology using Multiple Endmember Spectral Mixture Models. *Photogrammetric Engineering & Remote Sensing*: Special issue on applications of remote sensing and GIS to urban analysis, 69 (9):1011-1020.
- Rashed, T. and Weeks, J. 2003 . Assessing Social Vulnerability to Earthquake Hazards through Spatial Multicriteria Analysis of Urban Areas. *International Journal of Geographic Information Science*, 17(6):549-576.

For a more complete list of Dr. Rashed's publications and research interests, visit:

<http://www.geography.ou.edu/people/rashed.html>

MAJOR PROFESSIONAL AFFILIATIONS

The Association of American Geographers; The Urban and Regional Information Systems Association (URISA); The American Society for Photogrammetry and Remote Sensing (ASPR); Sigma-Xi Scientific Research Society, and The Academic Council of United Nations System.