

WESTERN UNIVERSITY
DEPARTMENT OF GEOGRAPHY
GEOGRAPHY 3211A: Spatial Statistics

	Lectures	Labs
Location:	Middlesex College MC-17	Social Science Centre SSC-1425
Days:	Monday	Monday
Hours:	2:30 – 4:30 pm	4:30 – 6:30 pm

Website: <http://publish.uwo.ca/~jmalczew/3211.htm>

Prerequisites: Third or fourth year status at the University, Geography 2220A/B and one of Geography 2210A/B, Biology 2244A/B or Statistical Sciences 2244A/B, or other equivalent, or permission of the instructor.

“Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.”

Instructor Information

Name: Jacek Malczewski

Contact information:

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Office hours: Mon. 1:30 - 2:30 pm

Wed. 9:30 - 10:30 am

and by appointment

Course Syllabus

“Topics include exploratory spatial data analysis, global and local spatial statistics, spatial autocorrelation and interpolation, spatial regression models, and geographically weighted regression. The emphasis will be on developing analytical skills with practical applications using statistical software and Geographic Information Systems”.

There are four objectives of this course:

- (i) to apply a variety of spatial statistical methods to geographical data,
- (ii) to acquire problem solving skills with geographical data,
- (iii) to acquire skills in using GIS and statistical software for analyzing geographical data,
- (iv) to interpret results obtained by using methods of spatial statistics.

The course material is cumulative. Therefore you should review lectures and readings weekly - do not expect success if you only study and practice before exams. This course is also problem based, and applied - you must practice problems and do all exercises in order to fully understand the material and successfully complete the course.

SCHEDULE OF CLASSES

Lecture # Date	Topic	Readings
1	Introduction: course outline	
2	Nature of spatial data Exploratory spatial data analysis	Bailey and Gatrell, pp. 3-40 Anselin, pp. 43-91
22/09/2014	No classes (Field camps)	
3	Spatial weights	Anselin, pp. 106-128
4	Global spatial autocorrelation statistics	Anselin, pp. 129-138
13/10/2014	Thanksgiving Holiday	
5	Local spatial autocorrelation statistics	Anselin, pp. 138-164
27/10/2014	Mid-term test	
6	Spatial regression	Anselin, pp. 165-223 Bailey and Gatrell, pp. 282-289
7	Spatial regression (con.)	Anselin, pp.201-223
8	Geographically weighted regression	Charlton and Fotheringham
9	Spatial interpolation	ESRI, pp. 1-19. Bailey and Gatrell, pp. 161-201
10	Synthesis	

Note! Lecture attendance is critical. You cannot learn the material if you are not there.

Course Materials

Anselin L. (2005) *Exploring Spatial Data with GeoDa: A Workbook*,

<http://geodacenter.asu.edu/system/files/geodaworkbook.pdf>

Bailey, T.C. and A. C. Gatrell (1995) *Interactive Spatial Data Analysis*, London: Longman Group Limited. (QA278.2.B35 1995)

Charlton M. and S. Fotheringham (2009) Geographically Weighted Regression: A Tutorial on using GWR in ArcGIS 9.3 and White Paper, National Centre for Geocomputation: National University of Ireland. http://publish.uwo.ca/~jmalczew/GWR_Tutorial.zip

ESRI (2001) *ArcGIS Geospatial Analyst*, Redlands: ESRI.

<http://publish.uwo.ca/~jmalczew/geostat.zip>

Methods of Evaluation

LAB SCHEDULE

Date	Topic	% of final mark	Due date
29/09/2014	Exploratory spatial data analysis	5	06/10/2014
06/10/2014	Global spatial autocorrelation statistics	5	20/10/2014
13/10/2014	No classes (Thanksgiving Holiday)		
20/10/2014	Local spatial autocorrelation statistics	5	27/10/2014
27/10/2014	No lab		
03/11/2014	No lab		

10/11/2014	Spatial regression	5	17/11/2014
17/11/2014	Geographically weighted regression	5	24/11/2014
24/11/2014	Spatial interpolation	5	01/12/2014

You are required to attend labs in this course. Absence will be *penalised by deduction of 2% of the total course mark* for class missed. Medical and compassionate grounds, accomplished by suitable documentation, may be accepted as justification for late assignment submission. Assignments handed in after the due date will not be accepted.

Your grades will be based on composite performances for the following:

Assignments	30%
Mid-term test (open-book, 100 min. Oct. 27, 2014)	30%
Final exam (open-book, cumulative, 2 hours)	40%

The exams are designed to assess individual competence in course material. The focus is on material covered in lectures and labs. An open-book format applies. The final exam is cumulative.

Note: In accordance with university policy, missed tests and exams cannot be made up except on written medical grounds and notification prior to exam date (see <http://counselling.ssc.uwo.ca/procedures/examinations.asp>).

For UWO Policy on Accommodation for Medical Illness and a downloadable SMC see: http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf

Downloadable Student Medical Certificate (SMC): <https://studentservices.uwo.ca> under the Medical Documentation heading

Students seeking academic accommodation on medical grounds for any missed tests, exams, participation components and/or assignments worth 10% or more of their final grade must apply to the Academic Counselling office of their home Faculty and provide documentation. Academic accommodation cannot be granted by the instructor or department.

Additional Statements

Statement on Use of Electronic Devices

No electronic devices will be allowed during tests and examinations.

Statement on Academic Offences

“Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.”

“All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).”

“Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.”

Western's commitment to accessibility

The University of Western Ontario is committed to achieving barrier free accessibility for persons studying, visiting and working at Western.

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Support Services

Registrarial Services: <http://www.registrar.uwo.ca/>

Student Development Services: <http://westernusc.ca/services/>

Social Science Academic Counselling: <http://counselling.ssc.uwo.ca/>

Students who are in emotional/mental distress should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.