

THE UNIVERSITY OF WESTERN ONTARIO
DEPARTMENT OF GEOGRAPHY
GEOGRAPHY 3223: Decision-making with GIS
Course Outline Winter 2019

| | Lectures | Labs |
|------------------|-----------------|-----------------|
| Location: | SSC-1004 | SSC-1059 |
| Days: | Tuesday | Wednesday |
| Hours: | 12:30 - 2:30 pm | 12:30 - 2:30 pm |

Prerequisites: Geography 2220A/B

“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: Jacek Malczewski

Office: Room 2422 SSC

E-mail: jmalczew@uwo.ca

Office hours: Monday 1:30 – 2:30pm

Wednesday 3:30 – 4:30pm

or by appointment via email

TA Information

Name: Daniel Kpienbaareh

Contact information:

Office: Room 1424 SSC

E-mail: dkpienba@uwo.ca

Office hours: Tue. 11:30am – 12:30pm

and by appointment

Course Syllabus

Objectives: This course introduces you to the principles of integrating GIS and decision analysis. Selected GIS-based decision-making methods are applied in practical sessions. A range of applications from both public and private sector organizations are covered.

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

SCHEDULE OF CLASSES

| Date/Lecture # | Topic | Reading - textbook |
|-----------------------|-----------------------------------------|-----------------------------------|
| 08/01/2019 | Introduction: course outline | Ch. 1, p. 3-14 |
| Lec. 1 | GIS and multicriteria decision analysis | Ch. 2, p. 15-80; Ch. 3, p. 81-100 |
| Lec. 2 | Evaluation criteria | Ch. 4, p.103-136 |
| Lec. 3 | Decision alternatives and constraints | Ch. 5, p. 137-158 |
| Lec. 4 | Criterion weighting | Ch. 6, p. 177-195 |
| Lec. 5 | Additive weighting methods | Ch. 7, p. 197-217 |
| 19/02/2019 | No class | |
| 26/02/2019 | Mid-term exam | |

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|------------|----------------------------|--------------------|
| Lec. 6 | Analytic hierarchy process | Ch. 7, p. 217-223 |
| Lec. 7 | Ideal point methods | Ch. 7, p. 223-226 |
| Lec. 8 | Fuzzy aggregation methods | Ch. 7, p. 230-233 |
| Lec. 9 | Sensitivity analysis | Ch. 8, p. 261-269 |
| Lec. 10 | Synthesis | Ch. 10, p. 311-339 |
| TBA | Final exam | |

Require reading (textbook)

Malczewski J. (1999) *GIS and Multicriteria Decision Analysis*, New York: Wiley.

LAB SCHEDULE

| Date | Topic | % of final mark | Due date |
|------------|------------------------------------------------------|-----------------|------------|
| 27/02/2019 | 1. Structuring decision problem: Evaluation criteria | 5 | 06/03/2019 |
| 06/03/2019 | 2. Decision alternatives and criterion weighting | 5 | 13/03/2019 |
| 13/03/2019 | 3. Decision rules: Part I | 5 | 20/03/2019 |
| 20/03/2019 | 4. Decision rules: Part II | 5 | 27/03/2019 |
| 27/03/2019 | 5. Sensitivity analysis | 5 | 03/04/2019 |

1. The lab component of the course consists of five assignments worth 25% of your final grade.
2. Assignments will be explained and discussed during lab sessions. If you have problems with any aspect of the assignments, please come and talk to me during my office hours.
3. Computer software will be used in the preparation of the assignments. It is essential that students unfamiliar with computers and quantitative analysis take extra time (in addition to regular lab time) to familiarise themselves with software to be used in this course.
4. Attendance at labs is *mandatory* and absence will be *penalised by deduction of 2% of the total course mark* for each lab missed. *An assignment loses 10% of its total possible value for each day late. Assignments more than 5 days late will not be accepted.* Medical and compassionate grounds, accomplished by suitable documentation, may be accepted as justification for late assignment submission.

MARKING SCHEME

Grades will be based on composite performances for the following:

| | |
|----------------------------------------------------|-----|
| Mid-term Exam (open-book, 100 min., Feb. 26, 2019) | 30% |
| Final Exam (open-book, cumulative, 2 hours, TBA) | 30% |
| Exercises | 25% |

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. A restricted open-book format applies; only a calculator, textbook and lecture notes can be used in the test and exam. A calculator is essential for the mid-term test and final exam.

Note: In accordance with university policy, missed tests and exams cannot be made up except on written medical grounds and notification prior to test/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/pdf/academic_policies/appeals/accommodation_medical.pdf

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: https://accessibility.uwo.ca/students/support_services.html

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.

Important Dates

January 7: Classes resume

January 15: Last day to add a second term half course

February 18: Family Day – Department Office Closed

February 18 to 22: Spring Reading Week (No classes; Department Office open)

March 7: Last day to drop a second term half course without penalty

April 9: Classes end

April 10: Study day

April 11-30: Examination Period