1. Basic Spatial Analysis

1.1 Basics

Instructor: Steven Manson
Office: 473 Social Sciences, West Bank
Phone: (612) 625-4577
Email: manson@umn.edu
Office hours: 1130a-100p W

Prerequisites: Geog 3531 and 3561/5561; similar statistics and GISc courses; or instructor consent.
Course URL: access via Moodle
Credit: 3 units

Class meetings: Lectures W 200p-300p; Labs W 300-430p. Blegen Hall 445/455, West Bank.
Materials: All readings and other material are available for free via Moodle.

1.2 Course overview

Subject. Spatial analysis is used to understand a range of human and environmental systems, their patterns and dynamics, and their interactions with the broader world.

Students. Students in this course have come from across the social, natural, and information sciences with no clear majority in any one area. This distribution makes for a lively and challenging meeting of the minds. The course is oriented towards Masters, MGIS, or PhD students. Advanced undergraduates are invited to speak with the instructor to determine if they would find the course appropriate to their educational goals.

Purpose. This course expands on aspects of GISc and statistics covered by previous courses. It is designed to give hands-on experience with advanced methods in spatial analysis, primarily focusing on using the GeoDa spatial analysis package but also allowing for several weeks of customized exposure to a range of other software systems.

Goals. Students who successfully complete this course will be able to use a range of spatial analysis tools to explore the patterns and dynamics of almost any problem that has a spatial element. This course can be used to gain insight into the technical underpinnings of introductory spatial analysis, complement on-going research, or provide an applied focus for research or policy.

Prior experience. Students should be proficient in GIS, basic mathematics, and standard statistical methodology including descriptive statistics and bivariate regression. As noted above in the prerequisites, this translates into having at least one statistics course and the Principles of GIS course or its equivalent. Students without this experience fare poorly in this course.

Structure. This is an intensive hands-on class with a focus on reading, discussion, and applications. This translates into 30% Lecture, 20% Discussion, 50% Laboratory.

2. Schedule

Date	*Topic*	*Activity*	*Readings*
Sept 8	Course description		
Sept 15	Modeling I	Lab 1	UG 3–18, 35–38, 42, 54–64; RN 7–8 Anselin 2006a, Anselin 1992, Unwin 1996
Sept 22	Modeling II		Anselin 2000
Sept 29	Data	Lab 2	UG 19–31, 63–64; RN 13–17, 20–21 Meentemeyer 1989, Manson 2008
Oct 6	Data analysis	Lab 3	UG 39–40, 65–76; RN 23–32, 43–44 Haining 1998, Murray 2001
Oct 13	Spatial relations	Lab 4	UG 78–87; RN 18–20 Anselin 2006b
Oct 20	Project work	Project	Project work
Oct 27	Global autocorrelation	Lab 5	UG 88–94 Diniz-Filho 2003
Nov 3 *Nov 6*	Local autocorrelation ***Project proposal due***	Lab 6	UG 99–105 Anselin 1995
Nov 10	Bivariate correlation	Lab 7	UG 94–96, 105 Sridharan 2007
Nov 17	OLS /spatial diagnostics	Lab 8	RN 45–56 Diniz-Filho 2003, Anselin 1995
Nov 24	Thanksgiving		No class meeting
Dec 1	Project work	Project	Small group and one-on-one sessions
Dec 8	Wrap up / project work	Project	Class meeting for wrap-up discussion
Dec 15	Project work	Project	***Project report due***

3. Evaluation

Students are evaluated on their class participation, labs, and a project. Each component is assigned a certain number of points. Points are cumulative, or in other words, each counts towards your final point total. The chief advantage of this system is that you know exactly how many points you have and how many you need to achieve a given grade level, as discussed below in the final grade determination.

Component	*Points*
Participation	50
Labs	250
Project	150
Proposal	40
Final report	110
Total	450

3.1 Components in detail

Participation

The key to a successful class experience is participation, which in turn relies on students reading the materials, attending class meetings, completing work in a timely manner, and discussing the material and related issues. Please also consult the course policies on class meetings. Points for participation are based on the following criteria: demonstration that the student has read and understood class material; discussion arguments that evidence creativity and logical structure; consistent participation without monopolizing the discussion; and constructive examination of issues couched in an atmosphere of civility and mutual respect.

Project

Students will write a technical review to describe how a given software application applies to a specific problem (e.g., working with GeoDa to develop Spatial Error and Lag models). We will discuss examples of topics and applications in class and they are developed in the resources section below. Each student will work with the instructor through the semester to develop a project proposal and subsequent paper. The project can advance existing research projects and satisfies the 'technical paper' requirement for MGIS students.

In addition to consulting the general resources on writing and research, be sure to consult resources on project planning, technical reviews, research papers, and literature reviews.

Deliverables: See the course schedule for due dates.

1. Project proposal of around 500 words that specifies a project plan.
2. Project report of 3000-4000 words, excluding graphics, bibliography, and appendices.

Labs

Labs are a prime focus of class, where students learn by applying topics developed from readings and discussion. Each student is required to attend lab sections during the scheduled times.

Deliverables: Lab due dates are indicated in the lab assignments.

3.2 Grading Criteria

The following criteria are used in grading written work, including labs and projects. Note that not all these criteria may apply to a given project, so ask your instructor when uncertain.

Grade	*Style*	*Substance*
A	Clear and novel organization Accessible and concrete language Few mechanical errors Noteworthy graphics	Well supported arguments Use of pertinent examples and facts Awareness of complexities Appropriate use of sources
B	Clear and competent organization Few sentence errors Well-prepared graphics	A few incorrect statements Adequately supported statements Appropriate secondary sources
C	Clear organization Adequate content Adequate graphics	Several incorrect statements Major arguments supported Inconsistent use of sources
D	Unclear organization Many mechanical errors Incomplete visual graphics	Many incorrect or unclear statements Unsupported arguments Irrelevant or misapplied examples

3.3 Final grade determination

Each evaluation component is assigned a certain number of points. Points are cumulative, and per the table below, you need to reach a certain point threshold. To get an A-, for example, you need to accumulate at least 367 points while a C+ requires 233 points.

A-F	*N-S*	*Points*	*Description*
A	S	400	Achievement that is outstanding relative to the level necessary to
A -		367	meet course requirements
B+		333	Achievement that is significantly above the level necessary to
B		300	meet course requirements.
B -		267	
C+		233	Achievement that is in keeping with the course requirements in
C		200	every respect.
C -		167	
D+	N	133	Achievement that is worthy of credit even though it fails to meet
D		100	fully the course requirements.
F		0	Work that was either completed but not worthy of credit or incomplete (I) without a student-instructor agreement.

4. Resources

It is useful to think of the project as a ***topic*** in combination with an ***application***.

4.1 Topics

The following list of topics are logical complements and/or extensions to the material covered in class. There are other topics out there, so speak to the instructor if you want to pursue something not on this list, especially if it relates to your own work.

Descriptive statistics and clustering
There is a good deal of work on the spatial analysis of point data, including measures of location (central feature/mean center), dispersion (standard distance/directional distribution), neighborhoods (average nearest neighbor distance), and clustering (Ripley's k-function, average nearest neighbor distance, high/low clustering).

Suggested programs and starting points:

- ArcGIS: implements many basic measures in its Spatial Statistics Toolbox
- Crimestat: provides a spatial modeling toolkit (see the section "space-time analysis")
- R: offers several different spatial analysis libraries (called "packages"), per below

Readings to start with: Dungan 2002; Perry 2002; Perry 2006

Advanced EDA/ESDA
There are more sophisticated ways to do EDA and ESDA than covered in class, especially those that incorporate time or more than two dimensions.

Suggested programs and starting points:

- GeoDA: start with advanced Multivariate (GDW 10) and advanced ESDA (GDW 12)
- Crimestat: see spatial description and modeling toolkits for assistance in EDA and ESDA analyses (not explicit, be creative in application)
- GeoVista: provides dynamic graphical interface for enhanced EDA visualizations

Readings to start with: Alessa et al. 2008; Dykes 1998; Winkler et al. 2007

Spatial regression/modeling
There is a large family of spatial models designed to deal with the violations of OLS models. The field is rapidly evolving and broadly shared among disciplines.

Suggested programs and starting points:

- GeoDA: Spatial Error (GDW 24) and Spatial Lag (GDW 25) models
- ArcGIS: Geographically weighted regression
- R: several packages, see below
- Win/GeoBugs: Bayesian/Hierarchical modeling

Readings to start with: Anselin 2002; 2003, Anselin, Florax and Rey 2004; Dubin 1998

Smoothing/interpolation/prediction
One important form of modeling is the family of smoothing, interpolation, and prediction (these terms are used differently among different fields). Key topics including density measures, interpolation (e.g., inverse distance weighted), kernel smoothing, trend surfaces, and geostatistical approaches.

Suggested programs and starting points:

- ArcGIS: explore spatial statistics, spatial analyst, and geostatistical toolboxes
- R: provides great capabilities for spatial statistics, see below
- CrimeStat: offers several interpolation/smoothing/prediction toolkits, see below
- Idrisi: PATTERN and INTERPOL modules and tutorial exercises.

Readings to start with: Kafadar, K., and P. S. Horn 2002; Legendre 2003; ArcGIS and Idrisi help files have other leads.

Rate mapping/smoothing
Rate data have characteristics that make them interesting to handle. Work in public health, crime, and disease research is particularly applicable.

Suggested programs and starting points:

- GeoDA: See the User's manual and Workbook for tutorials (e.g., Basic Rate Mapping (GDW 13), Rate Smoothing (GDW 14), and Spatial Autocorrelation Analysis for Rates (GDW 20))
- WinBugs: Provides alternative analyses such as Bayesian methods

Readings to start with: MacNab and Dean 2001; Huang et al. 2009

4.2 Applications

The following is a list of applications well-suited for spatial analysis. There are many others out there, so talk to the instructor if you have one in mind.

ArcGIS

WWW: http://www.esri.com/software/arcgis/

Manual: many available online or in book form, including Ormsby, T., and R. Burke. 2004. Getting to know ArcGIS desktop: basics of ArcView, ArcEditor, and ArcInfo: ESRI Press. The online help system is quite good [http://webhelp.esri.com/arcgisdesktop], especially the overview of the ArcGIS Spatial Statistics Toolbox.

Tutorial: ESRI offers built-in help and online tutorials via it's help system, including "Understanding Spatial Statistics in ArcGIS."

R language

WWW: http://cran.r-project.org/

Manual: R can be downloaded for Unix, Mac, and Windows. The main web site and installation offer documents explaining various aspects of R including but not limited to: language definitions, writing extensions, data import/export, installation, internals and coding structure, and a reference guide.

Tutorial: There are no formalized tutorials but the web is an excellent resource for help, especially with expert discussion boards and examples of numerous functions, scripts, and statistical analyses. The most common spatial statistical extensions are found at http://r-spatial.sourceforge.net/ and http://geodacenter.asu.edu/r-spatial-projects. Two in particular are helpful:

- Spdep: http://cran.r-project.org/web/packages/spdep/index.html
- Spatstat: http://cran.r-project.org/web/packages/spatstat/index.html

Crimestat III

WWW: http://www.icpsr.umich.edu/CRIMESTAT/

Manual: A comprehensive review of Crimestat's background, capabilities, and specific applications with sample datasets can be found in the User's Workbook and original publication Levine (2009), download at [http://www.icpsr.umich.edu/CRIMESTAT/workbook.html], see the "Download All Files tab" for the complete Crimestat III package.

Tutorial: Individual chapters describe each respective toolkit and offer sample datasets for which sample analyses can be generated (recommended, step by step directions).

Idrisi

WWW: http://www.clarklabs.org/

Manual: Idrisi is the premier raster-based GIS package, offering a mix of day-to-day and high end research tools. It comes with a detailed user guide.

Tutorial: Idrisi offers a great set of tutorials and sample data, see under the help menu.

SatsScan

WWW: http://www.satscan.org/

Manual: Satscan is a versatile spatial statistics program that is devoted to space-time analyses of all types (see bulleted points under purpose for specific applications). The main web page offers a user's guide that describes various attributes of the software and their applications.

Tutorial: An exhaustive list of papers discussing statistical methodology and selected applications (by field of study) can be found on the main web page bibliography, as can sample data.

STARS

WWW: http://regionalanalysislab.org/index.php/Main/STARS

Manual: REGAL provides a user-friendly interface with dynamic graphical views for users interested in advanced exploratory data analysis (EDA, see above). An overview of REGAL can be found under the tab "screenshot page." Under the tab "papers and presentations" you will find detailed descriptions of toolkit designs, package capabilities, applications, and future directions.

Tutorial: See the "papers and presentations" tab for guidance on user defined applications.

GeoVista

WWW: http://www.geovistastudio.psu.edu/jsp/index.jsp

Manual: This program focuses on geocomputation and geographic visualization, and provides a programming-free environment. Under the navigation bar at the top of page you will find: program

overview, publications and supporting documents, and specific examples. The quick start user's guide can be found at [http://www.geovistastudio.psu.edu/jsp/usersguide.jsp].

Tutorial: For a step by step guide, see [http://www.geovistastudio.psu.edu/jsp/tutorial.jsp]. Also, these tutorials include sample datasets that can serve as an excellent example/framework for your project.

WinBugs/GeoBugs

WWW: http://www.mrc-bsu.cam.ac.uk/bugs/

Manual: For an overview of WinBugs, see [http://www.mrc-bsu.cam.ac.uk/bugs/winbugs/contents.shtml]. You will find directions for a quick start, program contents, and a complete description. Also, PDF versions of WinBugs documentation are available on this page. For an overview of GeoBugs, see [http://www.mrc-bsu.cam.ac.uk/bugs/winbugs/geobugs.shtml], where you will find a PDF GeoBugs manual. Note that it is important to understand Bayesian methods and applications before using these programs.

Tutorial: No formalized tutorial, but the manuals for both WinBugs and GeoBugs contain specific examples and illustrations of program applications.

5. Bibliography

Alessa, L., A. Kliskey, G. Brown. 2008. Social-ecological hotspots mapping: A spatial approach for indentifying coupled social-ecological space. Landscape and Urban Planning 85: 27-39.

Anselin, L., and A. Getis. 1992. Spatial statistical analysis and geographical information systems. Annals of Regional Science 26GIS:19-33.

Anselin, L. 1995. Local Indicators of Spatial Association--LISA. Geographical Analysis 27:93-115.

Anselin, L., J. Cohen, D. Cook, W. Gorr, and G. Tita. 2000. Spatial Analyses of Crime. In Criminal Justice: Measurement and Analysis of Crime and Justice, ed. D. Duffe, 213-262. Washington, DC: National Institute of Justice.

Anselin, L. 2002. Under the hood: Issues in the specification and interpretation of spatial regression models. Agricultural Economics 27 (3):247-267.

Anselin, L. 2003. Spatial externalities, spatial multipliers, and spatial econometrics. International Regional Science Review 26 (2):153-166.

Anselin, L., R. J. G. M. Florax, and S. J. Rey eds. 2004. Advances in Spatial Econometrics: Methodology, Tools, and Applications. New York: Springer-Verlag.

Anselin, L., I. Syabri, and Y. Kho. 2006a. GeoDa: An introduction to spatial data analysis. Geographical Analysis 38 (1):5-22.

Anselin, L., and S. J. Rey. 2006b. Spatial Econometrics: Theory and Practice: DRAFT Chapter 3.

Dale, M. R. T., P. Dixon, M. J. Fortin, P. Legendre, D. E. Myers, and M. S. Rosenberg. 2002. Conceptual and mathematical relationships among methods for spatial analysis. Ecography 25 (5):558-577.

Diniz-Filho, J., L. Bini, and B. Hawkins. 2003. Spatial autocorrelation and red herrings in geographical ecology. Global Ecology and Biogeography 12 (1):53-64.

Dubin, R. A. 1998. Spatial autocorrelation: a primer. Journal of Housing Economics 7 (4):304-327.

Dungan, J. L., J. N. Perry, M. R. T. Dale, P. Legendre, S. Citron-Pousty, M.-J. Fortin, A. Jakomulska, M. Miriti, and M. S. Rosenberg. 2002. A balanced view of scale in spatial statistical analysis. Ecography 25:626-640.

Dykes, J. 1998. Cartographic Visualization: Exploratory Spatial Data Analysis with Local Indicators of Spatial Association Using TcI/Tk and cdv. Journal of the Royal Statistical Society. Series D (The Statistician) 47 (3):485-497.

Haining, R., S. Wise, and J. Ma. 1998. Exploratory Spatial Data Analysis in a Geographic Information System Environment. Journal of the Royal Statistical Society. Series D (The Statistician) 47 (3):457-469.

Huang, B., L. Zhang, and B. Wu. 2009. Spatiotemporal analysis of rural-urban land conversion. International Journal of Geographical Information Science 23 (3):379-398.

Kafadar, K., and P. S. Horn. 2002. Smoothing. In Encyclopedia of Environmetrics, eds. A. H. El-Shaarawi and W. W. Piegorsch, 1-7: Wiley.

Legendre, P. 1993. Spatial Autocorrelation: Trouble or New Paradigm? Ecology 74 (6):1659-1673.

MacNab, Y.C., and C.B. Dean. 2001. Autoregressive spatial smoothing and temporal spline smoothing for mapping rates. Biometrics 57: 949-956.

Manson, S. M. 2008. Does scale exist? An epistemological scale continuum for complex human-environment systems. Geoforum 39 (2):776-788.

Meentemeyer, V. 1989. Geographical perspectives of space, time, and scale. Landscape Ecology 3:163-173.

Murray, A. T., I. McGuffog, J. S. Western, and P. Mullins. 2001. Exploratory Spatial Data Analysis Techniques for Examining Urban Crime Implications for Evaluating Treatment. British Journal of Criminology 41 (2):309-329.

Perry, J. N., A. M. Liebhold, M. S. Rosenberg, J. Dungan, M. Miriti, A. Jakomulska, and S. Citron-Pousty. 2002. Illustrations and guidelines for selecting statistical methods for quantifying spatial pattern in ecological data. Ecography 25 (5):578-600.

Perry, G. L. W., B. P. Miller, and N. J. Enright. 2006. A comparison of methods for the statistical analysis of spatial point patterns in plant ecology. Plant Ecology 187 (1):59-82.

Sridharan, S., H. Tunstall, R. Lawder, and R. Mitchell. 2007. An exploratory spatial data analysis approach to understanding the relationship between deprivation and mortality in Scotland. Social Science & Medicine 65 (9):1942-1952.

Unwin, D. J. 1996. GIS, spatial analysis and spatial statistics. Progress in Human Geography 20 (4):540-551.

Winkler, R., D.R. Field, A.E. Luloff, R.S. Krannich, and T. Williams. 2007. Social landscapes of the Inter-Mountain West: A comparison of 'Old West' and 'New West' communities. Rural Sociology 72 (3): 478-501.

6. Policies

Class meetings. You are expected to attend all class meetings and take notes. You are expected to fully participate by joining in discussions and by actively asking and answering questions to the best of your ability. During discussion, differences of opinion are expected and in many respects encouraged, but at all times participants must maintain a professional atmosphere of civility and mutual respect. In case of a missed class meeting, you should arrange to obtain notes from another student. Notes are not available from the instructor apart from materials posted to the course web site.

Readings. Everyone is expected to complete assigned readings before the pertinent class. Remember, if you do not understand some point, then it is likely others in the class had a tough time with it as well, so bring it up! I expect you to read everything assigned as required reading.

Class materials. My standing policy is to post lecture materials after lectures. Research on learning holds that note taking is useful for ordering short term memory and essential for the long term recall necessary for activities such as exam taking, project research, and for activities after the course is over. Each class is just one part of an overall body of thought that each student builds over the course a degree and beyond. Research also shows that handing out notes before the lecture can inhibit initial in-class processing of the information, and more importantly, prevents incorporating the lecture substance into overall student understanding. In many respects, the learning process is less about reproducing the lecture as such and more about incorporating the lecture into a larger architecture that is specific to each student. Once a student has had a chance to digest and order the lecture in a way that makes sense to him or her, it is far more effective at that point to take another look at the instructor's material to fill in gaps or amplify points.

Office hours. Office hours provide an opportunity to discuss material, get assistance, or talk informally about the class and other topics. I am not a mind reader – seek assistance from me when problems arise, and preferably before! The times noted elsewhere in the syllabus are when I am available in my office, barring unforeseen circumstances. I am also generally available Monday through Friday for appointments. To arrange a time, speak with me after class, call my office phone number, or email me.

Exam consultation. The instructor will not be available for consultation on exam topics 48 hours before an exam is given. If you have questions, be sure to ask them well ahead of time. This measure is intended to both encourage students to plan their studying and, more importantly, ensure equal access to the course instructor.

Emergency contact. If you urgently need to get a hold of me, call my office number (612 625-4577) or the main Department of Geography office (612 625-6080). The definition of urgent generally applies to when you cannot attend an exam due to special, documented circumstances.

Workload. Under UMN policy "one semester credit is to represent, for the average University of Minnesota undergraduate student, three hours of academic work per week (including lectures, laboratories, recitations, discussion groups, field work, study, and so on), averaged over the term, in order to complete the work of the course... All grades for academic work are based on the quality of the work submitted, not on hours of effort. It is expected that the academic work required of graduate and professional students will exceed three hours per credit per week...".

Labs. For courses with a lab or computational component, pay attention to lab rules. Students must often have a valid university ID card to use computing facilities. Eating, drinking, or smoking is not allowed in labs. A lab should be a quiet place for students to work; thus, noise should be kept to a minimum. Students should not store information on the hard disks in public computing facilities; be sure to maintain personal copies of data and backup copies. It is ultimately your responsibility to ensure your data is safe.

Mental health: University can be stressful, so keep in mind that you can access mental health services at the U. The Mental Health Clinic at Boynton Health Service provides phone and walk-in assessment on an urgent basis, as well as scheduled medication evaluations and management, chemical health assessment and counseling, and therapy. The University Counseling & Consulting Services provides confidential counseling for students dealing with academic stresses, personal and relationship concerns, or feelings of anxiety or depression. Also see www.mentalhealth.umn.edu.

Disabled students. Students with disabilities that affect their ability to participate in class or meet all course requirements are encouraged to bring this to the attention of the instructor during the first week of class. They are also encouraged to consult with Disability Services. It is University policy to “provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact their instructor early in the quarter to discuss their individual needs for accommodations.” (UMN)

Campus resources. The Learning and Academic Skills Center offers assistance aimed at helping students achieve academic goals. It is a division of the University Counseling & Consulting Services, which can point you to other resources..

Syllabus changes. Every effort will be made to follow the course syllabus; however, it is subject to change as the needs of the course demand or due to unforeseen circumstances.

Wireless and electronic devices. Please mute or turn off your wireless device unless you are expecting a very important communication. Under no circumstances may you engage in an email, voice, or IM exchange while in class, and only under extenuating circumstances may you leave the class to have such an exchange. Similarly, under no circumstances can you use a wireless device of any kind while sitting an examination. "Every instructor has the authority to restrict or prohibit the use of personal electronic devices in his or her classroom, lab, or any other instructional setting. It is expected that instructors will make reasonable accommodations for students with disabilities by working with Disability Services." (UMN).

Submitting assignments. Due dates for assignments are specified in the course schedule or they are given when assignments are given in class. All assignments are submitted in electronic format barring explicit directions to the contrary; see the electronic submission guidelines.

Late assignments. No-cost extensions are granted only for reasons applicable to absences as explained in the paragraph below, which details UMN polices. Otherwise, one of two different polices will apply to late assignments. The instructor may either 1) specify that no late assignment will be accepted, in which case a late assignment is worth zero points; or 2) specify that late assignments will be accepted but that

they will incur a penalty of 10% of the assignment total per day for up to five days (up to a 50% penalty) after which time the assignment will be worth zero points. If a lab is worth 40 points, for example, then a lab that scores 36/40 when submitted on time will score 32 points if one day late (32 = 36 - (10% of 40)), 28 points if two days late, 24 points if three days late, 20 points if four days late, and 16 points if five days late. If it is six or more days late, it is worth zero points. For the purposes of this policy, a day refers to a normal business day (Monday through Friday exclusive of University holidays).

Absences. In case of absence, students are responsible for acquiring class notes, completing assigned readings and exercises, and scheduling alternative exam dates with the instructor. Legitimate reasons for absence "include, but are not necessarily limited to, verified illness, participation in athletic events or other group activities sponsored by the University, serious family emergencies, subpoenas, jury duty, military service, and religious observances. This policy does not extend to voting in local, state, or national elections." (UMN) In case of illness, students must have a signed letter from his or her doctor, stipulating the nature of the student's illness and when the physician thought the student would be well enough to finish the work.

Scholastic dishonesty. Although group discussion of assignments is encouraged, all materials submitted by you must be your original work. Unless explicitly allowed for by the instructor in group assignments, submissions of substantially similar work by more than one student will be dealt with as acts of scholastic dishonesty… broadly defined as "any act that violates the rights of another student in academic work or that involves misrepresentation of your own work. Scholastic dishonesty includes, (but is not necessarily limited to): cheating on assignments or examinations; plagiarizing, which means misrepresenting as you own work any part of work done by another; submitting the same paper, or substantially similar papers, to meet the requirements of more than one course without the approval and consent of all instructors concerned; depriving another student of necessary course materials; or interfering with another student's work." (UMN) Note: scholastic dishonest will be reported to the Office for Student Conduct and Academic Integrity (OSCAI), which keeps track of repeat offenders and preserves the student's rights through appeal procedures. Please see their web site for information on scholastic dishonesty and how to avoid making a mistake. Scholastic dishonesty will result in penalties ranging from receiving no grade for an assignment to expulsion from the course.

Incomplete grades. Incompletes (I) are granted only when a student is forced to miss several weeks of class due to extraordinary circumstances such as a documented confining illness or family emergency. To receive an incomplete grade, students must obtain approval from the instructor before the last day of class. No incompletes will be given unless you have a prior written agreement with the instructor in the form of a CLA "Agreement for the Completion of Incomplete Work."

Grade disputes. If you wish to dispute the grade assigned to any part of an assignment or exam, you must establish your dispute in writing within 48 hours after the grade has been given to you. You must include a specific rationale for why you deserve a higher grade. In particular "I think I deserve a better grade" or "I need a higher grade" are not adequate rationales. Email this rationale to the instructor or deliver a printed copy to the instructor's mail box in 414 Social Sciences (and inform him by email that you have done so). If you are unsatisfied with any part of the dispute process, please contact the Student Dispute Resolution Center.

Extra credit. There are no extra credit assignments.

Work retention. "Any unclaimed final examinations or other major submitted student work should be retained by the department for at least one year so that they may be reviewed and/or claimed by students"(UMN). Exams and other course materials will not be retained for longer than one year.