ENSP 305 – SYLLABUS
Applied Spatial Analysis in Environmental Science and Policy – Fall 2021
TuTh 5:00pm - 6:15pm - ANS 0509

Contacting the Professor	
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Course Description

Welcome to ENSP 305, "Applied Spatial Analysis in Environmental Science and Policy."
This course is intended for students interested in pursuing career or graduate research opportunities that will include management of environmental databases, detailed analysis of environmental data, and/or application of predictive environmental models. Students will learn necessary skills to manage and analyze environmental data through hands-on training in commonly used software and a series of topical case studies. Data analysis and data management will be taught using publicly available real-world environmental data sets.

Goals

This course will provide you with an introduction to the use of Geographic Information Systems (GIS) technology for environmental analysis. Each week this course introduces the fundamentals of GIS theory, and then provides practical hands-on training using ArcGIS 10, a popular desktop mapping program from ESRI. The purpose of this course is to introduce students to a variety of advanced GIS techniques that will be useful in solving real-world spatial analysis problems. Although intended for students in the Environmental Science and Policy program, this course is suitable for anyone interested in learning applied methods in environmental studies.

Course Objectives:

After reviewing the basics of GIS use, students will learn how to investigate environmental issues by taking a spatial problem solving approach.

By the end of this course you should have achieved the following:

1. Understand the basic cartographic concepts involved in preparing a map, and learn to use ArcGIS to create original maps and export them to standard graphics formats.
2. Understand the common sources of existing Environmental GIS data available from the Internet, commercial vendors, and government agencies.
3. Learn to apply spatial analysis techniques for performing environmental impact assessment and facility siting analysis.
4. Raster Overlay Modeling – Students will learn the theory behind raster overlay "map algebra" analysis, and how to apply raster modeling to conducting site suitability analyses (such as preferred habitat for a threatened species) using ArcGIS Spatial Analyst.
5. Optimum Path Analysis – Students will learn how to use a "cost surface" created using raster modeling in a "least-cost path analysis" to find the optimum route between two points that meets user-specified requirements. Possible applications include finding likely black bear migration routes as a means of identifying where wildlife crossings are needed, or finding the most environmentally sound route for a new pipeline.

Readings:

Supplemental materials and readings will be provided through ELMS

Evaluation Procedures

Grade Categories	Description of the requirements	Weight Toward
Lab Assignments	There will be four Lab Assignments involving the development of maps or analyses using ArcGIS.	25%
Homework	There will be 2 homework assignments designed to prepare students for the independent and group projects.	20%
Individual Project	All students will conduct an environmental analysis of their choice using at least one spatial analysis technique (Buffer, Clip, Union, Intersect, or Dissolve) and prepare a map illustrating their findings.	20%
Group Project	Students will conduct a group project that demonstrates their understanding of raster-based spatial analysis and their expertise with the ArcGIS software to answer an environmental question of their choice.	20%
Participation	Students will receive up to 10% of their grade from their performance on pop quizzes, class discussions or other in class assignments.	15%

Technology Requirements:

Technology	Expectations for Use
ELMS	ELMS will be used to post the class syllabus, lecture notes, grades and other routine class information. Students should check the site at least once per week prior to each class, or more often as directed by the instructors.
Special tools:	Students will need a USB flashdrive (≥ 1 GB) to store GIS data for use outside the classroom.
ArcGIS 10 Software:	Students are expected to make use of ArcGIS resources outside the classroom to work on class assignments. The classroom is <u>not</u> always available between classes for student access. ArcGIS is available on specific library computers.

Additional Policies

Grading and evaluation	100-98% = A+, 97-92 = A, 91-90 = A-; 89-88 = B+, 87-82 = B, 81-80 = B-; 79-78 = C+, 77-72 = C, 71-70 = C-; 69-68 = D+, 67-62 = D, 61-60 = D-; ≤ 59 = F.
Attendance and participation	Each class in this course builds on the one before. Students are strongly encouraged to attend every session, and to participate in class discussions. Students who miss lecture or lab instruction without prior coordination with the instructor must catch up on their own (see details below).
Deadlines	See ELMS for due dates
Late or make-up work	No late work will be accepted without **prior** approval of the instructor. Make-up assignments will be allowed only with prior approval of the instructor, or medical documentation of severe illness or injury (see details below).
Code of Academic Integrity	Academic dishonesty (such as cheating on exams, plagiarism from the internet or other students, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents and forging signatures) is unacceptable and will result in referral to the Student Honor Council after which a determination of a violation will result in a failing grade in the course and a note on your transcript indicating a violation of the rules of academic integrity. The University's Code of Academic Integrity sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student, you are responsible for upholding these standards for this course:
Academic Accommodations:	If you have a documented disability, please contact Disability Support Services 0126 Shoemaker Hall. Each semester students with documented disabilities should apply to DSS for accommodation request forms which you can provide to your instructors as proof of your eligibility for accommodations. The rules for eligibility and the types of accommodations a student may request can be reviewed on the DSS website at http://www.counseling.umd.edu/DSS. Please provide your documentation to me well in advance of any scheduled due dates or exams so that I can be sure that all of your accommodation needs are satisfied.

Absences

An absence will only be considered "excused" under the circumstances described by the University's policies, available at: http://www.ugst.umd.edu/courserelatedpolicies.html In summary, it is the policy of the University to excuse the absences of students that result from the following causes: illness of the student, or illness of a dependent as defined by Board of Regents policy on family and medical leave; religious observance (where the nature of the observance prevents the student from being present during the class period); participation in university activities at the request of University authorities; and compelling circumstance beyond the student's control. **Students claiming an excused absence must (1) apply in writing and (2) furnish documentary support for their assertion that absence resulted from one of these causes.**

Illness:

The University will accept as an excused absence a self-signed note from a student who has missed a single lecture, recitation, or laboratory, attesting to the date of the illness. The note must also contain an acknowledgement by the student that the information is true and correct and that providing false information is prohibited under Code of Student Conduct. The student is also obligated to make a reasonable attempt to inform the instructor of his/her illness in advance. For non-consecutive, medically necessitated absences from more than a single lecture, recitation, or laboratory, I will follow the same policy. If absences become frequent, I will require further documentation from the Health Center or an outside Health Care Provider.

A student experiencing a prolonged absence from class or a student who will be absent for a Major Scheduled Grading Event shall be required to provide written documentation of the illness from the Health Center or from an outside health care provider. In cases where written verification is provided, the Health Center or outside health care provider shall verify dates of treatment and indicate the time frame that the student was unable to meet academic responsibilities. No diagnostic information shall be given. For further information on this policy, please see http://www.president.umd.edu/policies/v100g.html.

Finally, waiting until the end of the term to inform me of long-term physical or mental health issues - issues that will interfere with your learning in this course - is not acceptable. I am not here to judge, only to help you learn. The earlier you inform me the better, so that we both can assess together whether or not it would be best to withdraw from the course this term and take it again at another time. There is no shame in withdrawing if you are truly ill and need rest for healing properly rather than additional stress.

Religious Observances

The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs. Students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to

individual participation in religious observances. *It is the responsibility of the student to inform the instructor of any intended absences for religious observances in advance*. Notice should be provided as soon as possible but no later than the end of the schedule adjustment (drop/add) period.

Code of Academic Integrity

Academic dishonesty (such as cheating on exams, plagiarism from the internet or other students, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents and forging signatures) is unacceptable and will result in referral to the Student Honor Council after which a determination of a violation will result in a failing grade in the course and a note on your transcript indicating a violation of the rules of academic integrity. The University's Code of Academic Integrity sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student, you are responsible for upholding these standards for this course:

1. No cheating ("intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise");

2. No fabrication ("intentional and unauthorized falsification or invention of any information or citation in an academic exercise");

3. No facilitating academic dishonesty ("intentionally or knowingly helping or attempting to help another to violate any provision of this Code");

4. No plagiarism ("intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise").

For more information on the Code of Academic Integrity and all course related policies please go to: http://www.ugst.umd.edu/courserelatedpolicies.html

Copyright Protection for Class Materials

Commercial firms have been paying students to take notes and collect course materials, which are then copied and sold. Course materials that exist in a tangible medium, such as written or recorded lectures, Power Point presentations, handouts and tests, are copyright protected. Students **may not** copy and distribute such materials except for personal use and with the instructor's permission.

Course Evaluation

Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University. By completing all of your evaluations each semester, you will have the privilege of accessing online, at Testudo, the evaluation reports for the thousands of courses online at Testudo. Evaluations can be completed at www.courseevalum.umd.edu.