

GEO 323 / EVS 523

Geospatial Concepts and Tools

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Purpose of the Course:

Geospatial Concepts and Tools is designed to give students experience in using two-dimensional resources such as maps, aerial photographs, satellite imagery, and geographic information systems (GIS) as professional tools to visualize and communicate the details of three-dimensional space. In the process, it provides the basic skills needed to carry out spatial analysis. It is prerequisite to a number of courses in both geology and environmental science. This includes those courses that require people to visualize areas larger than one can see from a single point on the ground or areas as they change through time. It also includes those courses that involve students to use abstract tools in understanding or describing specific areas.

Delivery System:

Geospatial Concepts and Tools has an unusual delivery system: It is a multimedia course. *It is NOT an independent study course; nor is it a distance-learning course*, although it uses technologies commonly associated with both of these approaches to education. To this end, the lecture is not in the standard format, where I stand in front of the classroom and blather. Rather, the lecture material and most of the exercises have been placed in multimedia format and are available in the BGES Map Laboratory, SR G-75. You are free to listen to the lecture and to access the exercises whenever you wish and as many times as you wish. All laboratory materials can be found in SR G-75.

The goal of this delivery system is to provide students with as much flexibility in timing as possible. It may take some time to adjust to multimedia presentation, but most students do so quickly.

The key to this course, in many ways, is the recitation section. This is the *only* formal meeting of the course. It will take place on Wednesday afternoons in SR G-75 to discuss the materials included in the previous week's assignment. These assignments correspond to the sections of the course. *The recitation sections are required*, and they are the major mechanism for students to insure that they understand the material.

Units of the Course:

This course is oriented around a series of units which are grouped into sections. The conduct of each week of the course will involve one unit. All materials and meetings for this course will be in the BGES Map Laboratory (SR G-75). *You should attempt to get as much done as possible as early as possible in the week.* You can get into the laboratory anytime during the hours in which it is open. You also have the opportunity to get access to the laboratory at other times. You will also need an account on the BGES computer network. An application for this account is attached.

Each unit begins with an introductory lecture, which you may attend either in the Remote Sensing Laboratory or at an off-campus computer. The lectures are written in Flash, which can be found on most computers. The laboratories, because they require you to use resources found only in the laboratory, must be done there.

Each introductory lecture is coupled with exercises which are guided by the computer, but which involve a considerable amount of practical hands-on work which must be done in the Remote Sensing Laboratory using the materials available there. For the most part, the exercises are given on the computer in multimedia format, although there will be some things that you must do on paper. You are encouraged to spend as much time in the laboratory as you need. You should determine how best to use the resources available to you. For example, you should feel free to complete all of the work in one fell swoop, if this method of working suits you. If you prefer, you may spend an hour or two in the laboratory on one day to identify the portions of the exercise you need help with, then work on the concepts of the laboratory at home, then come back to complete the material at some other time. You are encouraged to work with others in the class. This will include collaboration in the laboratory and participation on-line via the course discussion group,

You are very likely to have questions on the exercises. You should raise these questions on the discussion group, and you should bring them to the weekly recitation section, whose function is to allow you to ask questions about any aspect of the assignments you did not understand or which you want to discuss in class. Take this opportunity seriously: If you have questions on the meaning of stuff shown on the maps or how to do some of the things you need to do, they should be answered to your satisfaction during the recitation sections, it is better to deal with them there than to hide them until an examination where you discover you didn't understand the stuff after all.

Materials:

There is no required textbook for this course, since no book we know of can serve adequately as an overall reference. You may find it useful to consult a text in physical geography or geomorphology, but this is up to you. A textbook has been ordered for the bookstore as an "optional" resource; it is *Introduction to Geospatial Technologies* by Dr. Bradley Shellito. This is an excellent text that covers sections 1 and 4 of the course. However, it does not deal with sections 2 or 3 at all.

The laboratory exercises in this course provide direct experience in interpreting maps of different sorts and from different places. Most of the maps used in Geospatial Concepts and Tools are from the United States Geological Survey, the standard for the USA. In addition to these, there will be a number of maps from the Mexican Instituto Nacional de Estadística Geografía e Informática, which complement the US maps very effectively, as well as maps from a couple of other sources. You will, in general, be expected to understand every single notation on every map used in the course, regardless of its purpose or source. When any map text is in a language other than English, the translation will be given if needed.

How to Use Multimedia for Lectures and Exercises:

This is a multimedia course. There are several reasons for using multimedia. Two of these should be of greatest importance to you:

- You have almost total freedom as to when, where, how, and how often you will 'attend' lectures and do the work of the class. You can do it in one fell swoop, or you can spread the lecture out over several days.
- You can go over a single piece of material several times, if necessary, until it is clear. If you want, you can go back to material that was presented several weeks earlier as easily as you can deal with current material. You can also review lecture materials prior to course examinations.

The much greater flexibility inherent in multimedia course delivery requires some unusual things of you:

- Remember that all materials for the course -- including introductory lectures, exercises, and maps are available in the BGES Map Sensing Laboratory in SR G-75. If you attend the lectures from your home computer, you will still need to do the laboratory work on campus. *The maps are not to be taken from room SR G-75.*

- You will have to budget your time more carefully than you might have to in another course. It will be tempting to delay the laboratory until just before the recitation. *Don't do it!* You should plan to spend several hours in the laboratory after the lecture. Some laboratories will take upwards of 4-8 hours.
- Your grade will be based, in part, on [1] timely completion of exercises and [2] your sharing problems, questions, and observations with others in the class.

You may wish to bear some practical considerations in mind:

- This course is constantly being updated. It is always possible that some things may not work quite right. If there is a problem, please let me know as soon as possible. It may be something that can be fixed early in the week. If I can fix it, I will. If I can't, I'll leave word in the laboratory about how to work around the problem.

To use the multimedia in the laboratory, do the following:

1. Go to the laboratory. Choose a computer and turn it on. It will boot up into Windows. It will take some time for the machine to boot up from scratch; you should use a machine which is already on (but unoccupied by another student) if you can. When Windows has booted, you will be prompted to hit Control-Alternate-Delete to log on. When you do this, you will receive a logon screen. If somebody else has been using your computer previously to you, you will need to click on the "Switch User" button. Enter your User ID (your last name) and your Password (your initials, followed by your 7-digit Student ID number). Hit return (or click on OK), and the machine will proceed to boot up and enter the local area network. This may take a minute or two.
2. To enter the GCT introductory lectures or the exercises, find the icon on the desktop which looks like a globe and is labeled "Geospatial Concepts and Tools" respectively. Double-click on this icon to enter the course program.
3. Each introductory lecture begins with a sign-on screen and then goes to an outline of the unit. To see the entire unit, click on the unit title (all capital letters) with the mouse. The units are also divided up into portions, as indicated by the major headings in the outline. To see a portion of the unit, move to a first-level heading and click on it. If everything works right, you should hear this portion of the unit. Navigation through the lecture is done with the buttons commonly available on computer programs; you should recognize them quickly.
4. Exercises are guided by the computer. You should *always* follow the directions from the computer rather than the workbook in doing any of the exercises, as the workbook may provide only a cryptic indication of what you are supposed to do.
5. When the introductory lecture is completed or when the portion of the lecture you indicated you wanted to review is complete, the computer will return to the outline page. If you wish to review a portion of the unit, click on the appropriate section of the outline.
6. Each exercise begins with the name of a map and a question or series of questions. It should be fairly self-evident how to use these, but some parts of the exercise will take some getting used to.
7. The course is designed to work within a browser. In order to provide maximum resolution to the images in the course, the individual course pages have been adjusted to maximum width. Unfortunately, this has resulted in the height of the page being a bit greater than that of the typical computer screen. It is recommended that you experiment with the settings on your computer browser to determine which settings work best for you.

How to Use the Discussion Group:

The discussion forum is a significant tool in this course. Each unit has an associated discussion forum. To enter a discussion, you click on the button in the course program that appears as a 'D' in the lecture or the "Go to discussion group" link in the exercises. You will be directed to the discussion forum area of Blackboard Learn. There is also a general-issues discussion forum for the course.

Using the discussion forum for each unit is very easy. To post a new question or observation, click on the "Create Thread" button on the discussion page and type in your comment. To follow up on somebody else's comment, highlight the comment you wish to follow up and click the "Post Reply" button. Feel free to post any question or observation you wish to make. You should also look to see if any of your colleagues have had a similar question or observation. Add your two cents worth. I will monitor the discussion forum and answer questions that arise.

If you have a question or an observation you wish to make, you should look to see if any of your colleagues have had a similar question or observation. Add your two cents worth. I will monitor the discussion group and answer questions that arise.

- The purpose of the discussion group is to enable students in different sections of the course to collaborate with each other and to use your time more effectively. If you encounter a problem that you cannot solve, you should indicate it here.
- Part of your grade will be based on your participation in the discussion group.

Again, the easiest way to access the discussion forums is to use the D button on each page of the lecture or the link in the exercises. You can also use your browser to go to the following address: <http://www.bges.csuohio.edu/forums>. This site will take you to Blackboard Learn.

Role of the Recitation Sections:

GCT laboratories will be carried out in a way very different from the laboratories in most other science courses. You should find the practical exercises meaningful, but you will have to be careful to manage your time effectively, since nobody will pace you, and nobody will tell you when it is time to finish up. An unfamiliar aspect of the laboratory is that it involves an intensive recitation session every week to go over the material of the laboratory and to expand on it in directions that may be of interest. *These recitation sections are required, and they are the main vehicle for communication between instructor and students.* Students will be given the opportunity to sign up for recitation sections during the first week of classes.

The purpose of the recitation session is to provide an opportunity for intensive interaction between myself and all students in the class, to gain feedback as to the needs and progress of all students, and to provide a mechanism for all of us to apply the materials being presented to our own professional needs. The key to this tutorial approach is intensive interaction based on sound preparation. The formalisms adopted in making the recitation sessions work are intended to prepare you in a way that will make a intensive weekly session stimulating and meaningful, while reducing the busywork that often accompanies laboratories.

Recitation sessions will be arranged for one afternoon per week. We will attempt to provide enough sections to enable all students to sign up for a recitation session which will fit into their schedules. Each week's assignment is outlined in the course workbook and schedule, which you received at the beginning of the course. It will point you to both the multimedia lecture or lectures to be covered during the coming week, as well as the exercises to be carried out. You need to work out all of the exercises on the computer. You will receive instant feedback as to whether your responses to questions are correct or not, and you should feel that you understand *why* a correct answer is the one given on the

computer. If you do not, or if there is *any* question in your mind, you should note the question on the discussion group. You should also note your question on the appropriate pages in your workbook and turn them in at the beginning of the week's recitation. These pages, and the questions and comments on them, will form the basis of a discussion. These meetings will not be bull-sessions; they will be intense and thorough discussions of the materials and their implications. Everybody is expected to participate. Once the recitation is over, the exercise is complete, and we will move on. There will be *no* make-up. While you will be able to revisit both the introductory lecture material and the exercises for each unit any time during the semester, we will not revisit any of the material in recitations in future meetings.

You should be prepared to discuss the materials of the laboratory on several levels:

1. Any question asked in the laboratory exercise on the computer or on the handout.
2. Any problems you had in dealing with the questions (Note that I may phrase certain questions in a way that brings out problems. This is one of the best ways of training people to use judgement).
3. The implications of the questions asked in the exercise or any other aspect of the laboratory. You should feel free to bring these up, or I will bring them up myself.

I shall structure the discussion. If there is some aspect of the material you particularly want to discuss, note it on your answer sheet before you turn it in. My goal in this enterprise is to reinforce your understanding and skills. To this end, some of the discussions may involve materials you have not seen, but whose characteristics support the thrust of the laboratory, or they may involve your consideration of questions that are not asked in the question set. Throughout the discussions, the emphasis will not be on intellectual bravura (yours or mine), but rather on elucidating the information contained in maps and their role in the professional life of a geologist, environmental scientist, field biologist, or related practitioner in the 21st century.

This approach to the laboratory should provide substantially more feedback into your progress and understanding than traditional laboratories. But essential to making the approach work is for students to assume a greater than usual responsibility for expressing and dealing with problems. Normally, the instructor is the resource of first resort when you have trouble. That will not be the case here. All of the information you will need to carry out each exercise is given in the introductory lecture material, and you are encouraged to work together. Please note that ALL problems you have should be noted on your workbook pages, and most should be communicated to the discussion group. I shall be happy to help you outside of the recitation sessions, but I shall be loath to answer a question that is poorly expressed or which you have not yet made an effort to answer on your own.

My reasons for doing this are to encourage you to learn skills that are critical for any modern scientist or other land-oriented professional. Most of you will be employed in positions whose purpose is to identify and solve problems. I am deliberately adopting an approach in this course that forces you to formulate your questions effectively and then try to answer them before you come to me. I believe that some of you will find this one of the most valuable aspects of this course. However, you may find it frustrating, especially at first.

Basis of Grades:

Grades will be based on your timely completion of course material, participation in the course discussion group, attendance at and contribution toward the recitations, and your performance on three examinations and on other materials handed in at the end of the course. The timing of the examinations is given in the course schedule. Examinations will take place during the week (*not* during your recitation session) of the week shown. You will schedule a time at your convenience to take each examination.

You will receive a grade for each unit of the course, based on the recitation, for each examination, and for the materials from units 12-14 to be handed in during exam week. All grades in GEO 323 are reported on the following inverse scale:

1: A+	4: B+	7: C+	10: D+
2: A	5: B	8: C	11: D
3: A-	6: B-	9: C-	12: D-

Grades above 12 are failing: the grade of 15 is equivalent to an '0' on the standard scale, A grade of 25 is a flag grade that is given for excused absences and is normally changed.

Grades on tests will be reported in both 'raw' and 'cooked' format. The 'raw' score is the number obtained by grading the tests. It is converted to a 'cooked' grade by a formula devised according to the distribution of 'raw' grades. The 'cooked' grade will correspond to the scale above.

Grades on the final assignments (to be handed in) will be assessed directly in the above scale.

Recitations will be graded by the following schema:

- [1] Attendance at the recitation: 3 points.
- [2] Satisfactory completion of the assignment: 5 points. In this context, 'satisfactory completion' will mean [1] having your answers written out in your workbook and [2] being able to tell how you got your answer to any question, if you are asked. You are eligible for these 5 credits *only* if you attend the recitation.
- [3] Contribution of a question or an observation to the class discussion group in time for it to benefit others in the class: 3 points. You are eligible for these 3 credits *only* if you attend the recitation and you have completed the assignment satisfactorily.
- [4] Contribution to the discussion in the recitation: 3 points. You are eligible for these credits *only* if you attend the recitation *and* you have completed the assignment satisfactorily.

The points you receive for each recitation will be *subtracted* from your base score of 15. Thus, if you do not attend the recitation, your grade will be recorded as 15. If you attend the recitation and have completed the assignment satisfactorily (i.e. carry out the minimum expectation for the assignment), your grade will be recorded as 7. If you also contribute to the discussion, either via the Internet or by class discussion, your grade will be recorded as 1 or 4, as appropriate.

Your grade on the recitations and on each test will account for approximately 20% of your grade.

No makeup examinations will be given unless arranged for in advance. The grade of "I" (Incomplete) will not be given unless a Form Sheet for Assignment of Grade of Incomplete (CSU form 78-338) has been completed, This forms are available from the department office. It spells out what work needs to be turned in and by when it will be completed. You should bear in mind that University regulations require that final grades be submitted within 48 hours of the completion of the final examination. While this deadline is sometimes missed by faculty members, I shall try to adhere to it, because doing so is the only way to insure that students actually receive the grades they have earned. For this reason, if you intend to request a grade of 'I', you must have your request to me by the last class meeting.

Access to the Laboratory:

The Remote Sensing laboratory is generally open during business hours. Room G-75 is accessible at any time of interest to you, using the electronic lock. The lock has been programmed to recognize each student in the class. Your key is the *last* 6 digits of your student ID number (e.g. if your student number is 2987654, your key is 987654). You will be able to do everything you need in room G-75, but it may be useful for you to use the resources in the remote sensing laboratory when you need to.