GEOGRAPHY 331: ANALYTICAL AND COMPUTER CARTOGRAPHY

DR. LEE DEXTER - DEPARTMENT OF GEOGRAPHY - SPRING, 1998

Time/day: 3:30-5:30 MW Classroom: Bldg 82, F&G room 109
E-mail: lrd@alpine.for.nau.edu Web: http://www.for.nau.edu:80/~lrd
Office: F&G 205 Phone: 523-6535
Office hours: 11:30-2:30 M & W or by appointment

PREREQUISITES AND RECOMMENDED COURSES:

GGR 230 - Map and Image Interpretation (required)
Students will have a higher sense of achievement if they have any of the following:
GGR 330 - Cartography
Any math, especially algebra, geometry, trigonometry and intro statistics
Any computer related courses, especially applications or programming
Note: I assume a cartographic background but DO NOT necessarily assume any computer skills. This class can be completed with little or no computer background but will be considerably more difficult without a modest amount of previous computer experience!!

COURSE DESCRIPTION:

Computer assisted cartography extends the concepts, theory and techniques developed in map interpretation or cartography to an automated level where computers will be used to handle the mechanics of map compilation. This course will provide an overview of computer operation (with an emphasis on microcomputers) and the application of computers to input, manipulation, analysis and cartographic output of spatial data. The course will be divided between lecture, demonstrations and hands-on exercises as demanded by the specific topics. Several themes will be woven into the course material. These themes include:
* An "inside out" organization to computer mapping topics
* The use of cartographic objects (points, lines, areas)
* The "eleven types" of cartographic software
* The theoretical basis for computer cartography

COURSE OBJECTIVES:

* To provide a working overview of computing systems
* To become conversant with the theory behind automated cartography
* To be able to construct maps with a variety of cartographic software
* To be able to analyze spatial data with a variety of cartographic software
* To provide a foundation for further study of geographic information systems
TEXT AND MATERIALS:

The required readings will be found in:

Prentice Hall, New York. 2nd ed., 290 p. (about $50 used)

Other selected readings will be available by check-out from the geography department office.

An exercise workbook is required:

Available from Kwik Kopy, 575 Riordan Rd. (about $20).

A collection of lecture related material is required:

Available from Kwik Kopy, 575 Riordan Rd. (about $20).

In addition, each student must provide 6 to 10 three and one half inch double sided, high density micro floppy disks.

COURSE REQUIREMENTS:

Assigned readings from text and lecture supplement as per the tentative schedule.

Additional article readings as announced in class.

This is a lecture/demo/exercise course. Class meetings will consist of lectures and/or software demonstrations followed by hands-on exercise work on the part of the student. Your grade will depend upon your performance on approximately 11 such exercises and 2 written examinations and 1 final project.

COURSE POLICY:

Students are expected to attend each class meeting and tardiness is discouraged. While a certain amount of collaboration among students is encouraged, each student is expected to complete his or her own assignments. Anyone found plagiarizing assignments or cheating on exams will fail the course. A summary of standard university policies is attached.
PROFESSOR'S PHILOSOPHY:

My main focus, among all of my professorial roles, is teaching. I consider myself to be a dedicated and enthusiastic instructor. I am considered to be demanding in expectations but fair in grading and evaluation by most of my past students. My classes tend to be rich in content and I present you with a lot of material from which to learn. For a specific list of materials and learning approaches used in this class, see the teaching style attachment later in the syllabus.

In return for the amount of work I put into resource and class preparation, I expect you to be willing to work hard in absorbing as much of the material as you can. I would much rather work with an interested and enthusiastic C or D student than a bored and uncooperative A or B student. If you work from this attitude, you and I will get along just fine. If, on the other hand, you view your university experience as simply paid admission to a diploma, you and I may have conflicting objectives and attitudes.

To this end, some of the points awarded in this class reflect how seriously you approach the learning process as a cooperative endeavor. Items included in this group of points are attendance, punctuality, enthusiasm and cooperation. Some of these points will be objectively tracked (e.g. attendance) and some are my subjective opinion. You will all start out with the maximum number of points pre-awarded in this area. As the end the class approaches, a demerit system will be used if you have been deficient in these areas.

GRADING:

Each of the 11 exercises will be worth a maximum of 50 points and will be graded using a weighting scale as follows
- .9-1.0 * possible points (exceptional work, extra effort demonstrated)
- .7-.9 * possible points (meets basic requirements as described in the products)
- .5-.7 * possible points (incomplete or deficient in content)
- 0-5 * possible points (unsatisfactory, very incomplete or very deficient in content)

Each assignment is due 1 week after it is assigned. Work turned in beyond the due date will be penalized by 10 points per week. In addition, checked out materials kept beyond the check-out time limit may result in a 5 point loss.

Preliminary quiz is worth 40 points
Each exam will be worth 100 points
The final project will be worth 50 points
Cooperation, courtesy, attendance and promptness will be worth 60 points.

950 points total possible with a guaranteed scale of:
A >=90%, B >= 80%, C >=70%, D >=60%, F <60%.
**ADDITIONAL RESOURCES:**

This course will make use of several different computing systems and will require time to be spent on these systems. Much of the hands-on work may need to be performed at locations outside of the assigned classroom. You may elect to do some of the work on another computer system which may be available to you. Check with me for details on check-out procedures etc.

**TENTATIVE SCHEDULE:**

<table>
<thead>
<tr>
<th>DATE</th>
<th>LECTURE TOPIC</th>
<th>DEMO/ EXERCISE TOPIC</th>
<th>READING:</th>
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<tbody>
<tr>
<td>Jan 12</td>
<td>Intro &amp; overview</td>
<td>Windows/DOS/Mac OS exercise</td>
<td>Ch 1</td>
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<td>Jan 14</td>
<td>Cartographic principles</td>
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<td>Jan 19</td>
<td>MLK Day, no class</td>
<td>Cartographic layout exercise (opt.)</td>
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<td>Jan 21</td>
<td>Computing hardware (Quiz)</td>
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<td>Ch 2</td>
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<td>Jan 26</td>
<td>Computing hardware (Cont.)</td>
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<td>Jan 28</td>
<td>Computing software</td>
<td>Ch 2, 3, 15, 16</td>
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<tr>
<td>Feb 02</td>
<td>Input of planar spatial data</td>
<td></td>
<td>Ch 4, 5, 6</td>
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<td>Feb 04</td>
<td>DIDGER digitizing exercise</td>
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<td>Feb 09</td>
<td>WWW / GPS data acquisition</td>
<td>WWW / GPS data acquisition exercise</td>
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<td>Feb 11</td>
<td>Computer cartographic data structures</td>
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<td>Feb 16</td>
<td>Spatial data transforms</td>
<td>Transform exercise</td>
<td>Ch 10, 11, 12</td>
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<td>Feb 18</td>
<td>Open time (Dexter gone to Montana??)</td>
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<td>Feb 23</td>
<td>Projections</td>
<td></td>
<td>Ch 11</td>
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<td>Feb 25</td>
<td>PCMAPIRO exercise</td>
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<td>Mar 02</td>
<td>Open time for exam prep.</td>
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<tr>
<td>Mar 04</td>
<td>Exam #1</td>
<td>C.P.</td>
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<td>Mar 09-13</td>
<td>Spring break</td>
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<td>Mar 16</td>
<td>Cartometrics</td>
<td>CARTOM exercise</td>
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<td>Mar 18</td>
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Mar 23  Mapping point & line data  MAPVIEWER exercise #1
Mar 25  Dexter at AAG (Continued)  Ch 14, C.P.
Mar 30  Intro to AUTOCAD
Apr 01
Apr 06  Mapping isolines  Contouring exercise
Apr 08
Apr 13  Mapping area data  Ch 14, C.P.
Apr 15  MAPVIEWER exercise #2
Apr 20  Intro to GIS  M.A.P. II exercise
Apr 22
Apr 27-29  Final Projects
May 4  Final Exam, Monday 3:00-5:00 p.m.
NORTHERN ARIZONA UNIVERSITY POLICY STATEMENTS:

SAFE ENVIRONMENT POLICY
NAU's Safe Working and Learning Environment Policy seeks to prohibit discrimination and promote the safety of all individuals within the university. The goal of this policy is to prevent the occurrence of discrimination on the basis of sex, race, color, age, national origin, religion, sexual orientation, disability, or veteran status and to prevent sexual harassment, sexual assault, or retaliation by anyone at this university. You may obtain a copy of this policy from the college dean's office. If you have concerns about this policy, it is important that you contact the departmental chair, dean's office, the Office of Student Life (523-5181), the academic ombudsperson (523-9368), or NAU's Office of Affirmative Action (523-3312).

STUDENTS WITH DISABILITIES
If you have a learning and/or physical disability, you are encouraged to make arrangements for class assignments/exams so your academic performance will not suffer because of the disability or handicap. If you have questions about special provisions for students with disabilities, contact the Counseling and Testing Center (523-2261). It is your responsibility to register with the Counseling and Testing Center. A application for services should be made at least eight weeks before the start of the semester. If the Counseling and Testing Center verifies your eligibility for special services, you should consult with your instructor during the first week in the semester so appropriate arrangements can be made. Concerns related to noncompliance with appropriate provisions should be directed to the Disability Support Services coordinator in the Counseling and Testing Center.

INSTITUTIONAL REVIEW BOARD
Any study involving observation of or interaction with human subjects that originates at NAU-including a course project, report, or research paper-must be reviewed and approved by the Institutional Review Board (IRB) for the protection of human subjects in research and research-related activities. The IRB meets once each month. Proposals must be submitted for review at least fifteen working days before the monthly meeting. You should consult with your course instructor early in the course to ascertain if your project needs to be reviewed by the IRB and/or to secure information or appropriate forms and procedures for the IRB review. Your instructor and department chair or college dean must sign the application for approval by the IRB. The IRB categorizes projects into three levels depending on the nature of the project: exempt from further review, expedited review, or full board review. If the IRB certifies that a project is exempt from further review, you need not resubmit the project for continuing IRB review as long as there are no modifications in the exempted procedures. A copy of the IRB Policy and Procedures Manual is available in each department's administrative office and each college dean's office. If you have questions, contact Carey Conover, Office of Grant and Contract Services, at 523-4889.

ACADEMIC INTEGRITY
The university takes an extremely serious view of violations of academic integrity. As members of the academic community, NAU's administration, faculty, staff, and students are dedicated to promoting an atmosphere of honesty and are committed to maintaining the academic integrity essential to the educational process. Inherent in this commitment is the belief that academic dishonesty in all forms violates the basic principles of integrity and impedes learning. Students are therefore responsible for conducting themselves in an academically honest manner. Individual students and faculty members are responsible for identifying instances of academic dishonesty. Faculty members then recommend penalties to the department chair or college dean in keeping with the severity of the violation. The complete policy on academic integrity is in Appendix F of NAU's Student Handbook.
AGREEMENT OF UNDERSTANDING:

I have read the course syllabus for GGR 331, Analytical and Computer Cartography. I have had the opportunity to ask questions about the syllabus and course. I understand the content of the syllabus and agree to be responsible for the requirements and course policies.

I further understand that GGR 331 carries a prerequisite of GGR 230, Map and Image Interpretation. My signature indicates that I have completed these courses or, in consideration for the instructor's waiver of this requirement (if offered by the instructor), I agree to be responsible for any necessary background information and or knowledge equivalent to the content of GGR 230 needed to complete the requirements of this course, GGR 331.

Signature______________________________

Printed name__________________________

SSN______________________________

Semester GGR 230 taken:____________

Detach and turn in before the end of the second week of class to avoid administrative drop.