GIS - a mini intro

- GIS = Geographic (spatial) Information System (computer based)
- Based on relationships between table data (database) and locations on Earth
- Ask spatial questions: “Where is ...?”, “What is the closest ...?”, “How many ...?”, etc.
- Use GIS analysis techniques to find **spatial answers**
- Visualize and communicate results (usually via a map)
Syllabus

• read the full syllabus (WebCT, paper) for details!

• Course goal: **Introduction** to GIS operations and analysis in a geoscience context

• Preparation for thesis work and advanced GIS courses (next semester: GIS for Geoscientists II)

• ESRI’s ArcGIS 9.3 Desktop software

• Geol552 (but not Geol442) counts as part of the “Foundations of GIS” requirements for the GIS certificate: [www.design.iastate.edu/CRP/giscertificateprogram.php](http://www.design.iastate.edu/CRP/giscertificateprogram.php)


• Course structure:
  - 1 hour lecture (9:00 - 9:50)
  - 10 min. break
  - 1 hour lab/homework (10:00 - 10:50)
  - you can stay longer (next class at 2 pm?)

**Lecture (9:00 - 9:50)**

- One full book chapter per week:
  - first half on Tues., second half on Thurs.

- Preparation (you):
  - Read full chapter material **before** class
  - Answer review questions for chapter
  - Lecture: only go over “most important” material
  - You will get paper handouts - use them to make notes!
  - Your notes: most of the permanent value the class will have for you later

**Plan for Semester (prelim.)**

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Chapter</th>
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<tbody>
<tr>
<td>1</td>
<td>25-Aug</td>
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<td>Ch 8 - Raster Analysis (former Ch. 15)</td>
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<td>Hand in mprj3, quiz 3</td>
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<td>Ch 8 - Raster Analysis (former Ch. 15)</td>
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<td>24</td>
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<td>Break (Project)</td>
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<td>Break (Project)</td>
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<td>26</td>
<td>19-Nov</td>
<td>(TBA: GeoDBs, Networks, Project, ???)</td>
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<tr>
<td>31</td>
<td>TBD</td>
<td>Final</td>
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Lab exercises (10:00 to 10:50)

- Three types of practical exercises:
  - Textbook tutorial (step-by-step, **not** graded)
  - Homework exercises (2 - 4 textbook ex., graded)
  - Project work (mini project, class project, graded)
- TA (Nick Vreeland) + myself are here to help you with practical exercises

Homework exercises

- Short answers to exercises and tutorials are already in the book (pages 573 - 583)
- BUT: I want want detailed solutions: text, numbers, screenshots with homework! (part of grade)
- Start after lecture, ask us (me, TA), group work OK
- Hand in via Web CT (book exercises, projects only)
- Time given for:
  - homework exercise: 1 week
  - mini project: 2 weeks

Tests and grading

- 20 homework assignments: up to 4 pts. per exercise, typically 2 - 4 ex. (15% / 20% of grade)
- Midterm, Final test (20 - 25% each)
  - Open book: can use textbook + your notes (!)
  - Multiple Choice part (15 min.)
  - Practical part (60 min.)
- 2 quizzes (open book, 10%)
  - 20 min to answer 3 of 4 questions (write text)

Homework exercises

- Three mini-projects:
  - Larger exercises, material of previous, ~3 weeks
  - 15%/10% of grade

Final project

- Poster (only electronic form needed!)
  - +10 min. oral presentation (powerpoint)
- Material: up to you (your research?)
- Gr. 20%, UGr. extra credit
- Participation: 10%
- Extra points for lecture feedback (WebCT)
  - Best/Worst of last lecture
  - Clearest/Muddiest point of last lecture
  - What I learned today / What I didn’t get at all
  - Intelligent question about material

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Introductions

Instructor – Chris Harding

- Masters Degree in Geology (Geoinformatics)
- Worked for Lynx Geosystems (Vancouver, Canada) writing GIS software, Oil & Gas companies (Exxon, Shell)
- Ph.D. in Geology from University of Houston
- Associate Professor Geoscience Department
- Contact info: charding@iastate.edu, tel. 4-4868,
  Offices: 1620 Howe Hall
  Office hours: by appointment

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Your turn, tell us:

- Name?
- Major?
- Advisor? Thesis project?
- Prior GIS involvement?
- Why are you taking this course?

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GIS lab setup

- Log in with your usual ISU id + password
- In case of problems, for now use:
  Username: !gtlluser   Password: <ask_me>
- Network connection to GIS server
  \delphi.gis.iastate.edu\GEOL552
- From outside the GIS lab:
  read Connecting to GIS delphi server (WebCT)
Let’s test Web CT access

• Open web browser (firefox) at www.iastate.edu
• Click webCT (lower left)
• Login to WebCT Gold with ISU netID
• From course list select Geol 452-552

Google Earth

• Start it now (Desktop Shortcut)
• Under Search (upper left), enter a place (Ames, IA) and hit enter
• Activate only these layers (types of information):
  • Terrain
  • Roads
  • Borders
  • Populated places

Web CT - quick overview

• Home page (house icon): current items
• Announcements: Changes, reminders
• Assignment: Homework exercises
• Calendar: See what’s due + tests
• Discussion: lecture feedback
• Rest: Web Links, My Grades

• Notice the coordinates of the point (lower middle part)
• Now try: Mount Saint Helens
• Navigation: upper right part
• pan (left mouse), rotate, zoom (wheel), tilt (middle mouse)
• left-click/drag on “blobs”: eye = rotate, hand = move
• fly with arrow keys
• Change time (light): Press Sun button, move slider

• Try later:
  • Manhattan Island, Chicago (3D buildings = on), Grand Canyon, Mt. Everest, ...
  • For now: let’s start on today’s lab (HW 0)

Lab exercise (HW 0):
Where do/did you live outside of Ames?
• Task: Create a Google Earth (.kml or .kmz) file of a placemark
• Find of a place outside of Ames where you once lived (e.g., where you go during breaks?).
• Find this place in GoogleEarth (Use Search) and add a placemark (Press the Pin icon).

• Enter your Name and write a short description of what this place means to you

• In Google Earth, find your entry under Places (My Places). Now right-click on this entry (a pull-down menu appears) and save-as <my-name>.kmz

• Extra Point: What’s the coordinate of this place? (Latitude, Longitude, Elevation)

• In WebCT attach the saved kmz file to your assignment, press submit

Until Thursday’s lecture:
• Get "Mastering GIS" Book (4. ed. !)
• Read Intro and chapter 1 to p. 24
• Read Syllabus

On Thursday:
• Lecture: GIS example
• Lab: Chapter 1 Tutorial