FNRM 3131
Introduction to GIS in Natural Resource Management

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Office Hours by appointment (Online)
Objectives for Today

- Mechanics and grading
- Content
- Motivation
Conceptual understanding

This is an example of a feature dataset containing a geometric network for water distribution.

The pump station is a complex junction object, containing many simple junctions and simple edges.
• Organize and solve spatial problems
• Organize and solve spatial problems
Predictive knowledge

GFDL / NOAA Hurricane Floyd Forecast

16 Sept 1999 0330 UTC
FNRM 3131
Introduction to Geographic Information System (GIS) for Natural Resources

- Offered only On-Line
- Class based around textbook written by one of the course instructors for this specific class.
- Lab exercises apply the concepts covered in text.
- Students access the class material On-Line
Resources

Software

Two choices (you can switch at anytime)

1. Use virtual network connection into UMN network (Citrix/Apps to Go).
2. Install on home computer (Windows only)

These steps are covered in Quick Start documents on the Lab page of the Class Web Site.

Most students use Citrix/Apps to Go as you get access to a very fast Windows computer and lots of storage space.

What you need is a computer with a good Internet connection
Class Mechanics

Readings, short On-line videos and Labs each week. Tests every 2-3 weeks covering reading topics.

• Do readings **in advance** for week assigned
• Materials available on the website
FNRM 3131 - GIS For Natural Resource Management

Resources

- Syllabus (pdf)
- Canvas
- Lab Page
- Apps To Go (link to start UMN Citrix based virtual Desktop)

Materials, Organized Chronologically

Readings are from the book, "GIS Fundamentals, Sixth Edition," by Paul Bolstad

<table>
<thead>
<tr>
<th>Week</th>
<th>Chapters</th>
<th>Class Notes, Videos, Questions</th>
<th>Supplements</th>
<th>Lab Assignments</th>
<th>Assignments Due, Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Sept 7</td>
<td>Chap 1.2</td>
<td>Introduction to GIS</td>
<td>Geospatial Revolution, Links-GIS Notes</td>
<td>Lab 1: Complete assignment in ArcGIS Pro, instructions and data are on the Lab Page.</td>
<td>None - start Lab 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Videos: Course Mechanics Introduction, Basic Concepts, Raster Structure and Resampling, Data and File Structures, Coor. Questions</td>
<td></td>
<td></td>
<td>Take Canvas Reading Quiz 1 this week. There is a quiz every week that covers the readings for that week, and it closes Tuesday night of the on-line lecture day.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lecture PDFs 1, 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

http://giscourses.cfans.umn.edu/fnrn3131
Department of Forest Resources
University of Minnesota
FNRM 3131- GIS for Natural Resources – Fall 2020 (08/2020 – 12/16/2020)

FNRM 3131 – Fully Online class
All materials for the course are contained in the assigned text and the Class Website. Our text was written by the Dr. Paul Bolstad specifically for this class and contains all conceptual material covered in the class. This text is the basis of all class quizzes and exams. Short videos and other material are on the class Website which support and clarify concepts in the text. The class laboratory assignments and homework are used to provide a direct application of GIS concepts using ArcGIS Software.

The class follows a weekly schedule of as shown on the Website. The Website is the primary source of all course materials. The class Canvas Site is used for submitting assignments, taking reading quizzes, exams and grades.

Instructors:
Andrew Jenks
651-387-9600
ajenks@umn.edu

Paul Bolstad
612-624-9711
pbolstad@umn.edu

Class Hours:
On-Line: Instructors will be available via Zoom for questions and support:
Tuesdays 1:55 - 2:45 p.m.
Wednesdays 8:30 - 10:25 a.m., 12:50 - 2:45 p.m.
Thursday 9:35 - 11:30 a.m., 1:55 - 2:45 p.m.
Other hours can be arranged as needed; please call or email Andrew Jenks.

Required Texts:
GIS Fundamentals: A First Textbook on Geographic Information Systems, Sixth Ed., Bolstad, Paul V., XanEdu Publishing, 2019. This book should be at the St. Paul Campus bookstore or at the website https://www.xan.edu/higher-education/edtech/1601/38221535-on-books-catalog/gis_fundamentals_8e/. Readings from this book are required. There are also supplementary readings, which will be posted on the class web link, http://giscourses.cfans.umn.edu/fnrm3131.

Additional Resources: Most of you will use the lab software via an application called Citrix Desktop. Instructions on installation and virtual computer access are provided on the class website, http://giscourses.cfans.umn.edu/fnrm3131. While doing labs you should frequently save your work. You will be provided UMN class disk space, L:\home\(your id), with instructions provided during the first week on how to access this space; use it to back up your work.

Student Responsibilities: You should access on-line class materials, do the readings, do assigned lab and homework problems submit them via Canvas; complete all quizzes and
FNRM 3131 - GIS For Natural Resource Management

Resources
- Syllabus (.pdf)
- Canvas
- Lab Page
- Apps To Go (link to start UMN Citrix based virtual Desktop)

Materials, Organized Chronologically
Readings are from the book "GIS & Geodatabase: Sixth Edition" by Paul Bolstad

<table>
<thead>
<tr>
<th>Week</th>
<th>Chapters</th>
<th>Class Notes, Videos, Questions</th>
<th>Supplements</th>
<th>Lab Assignments</th>
<th>Assignments Due Date</th>
</tr>
</thead>
</table>
| 1 - Sept. 7 | Chap 1, 2 | Introduction to GIS
Videos: Course Mechanics Introduction, Basic Concepts, Raster Structure and Resampling, Data and File Structures, Coord. Questions,
Lecture PDFs 1 2 | Geospatial Revolution,
Notes-GIS,
Links, Notes-Links,
S trillion trees, What 3 Words | Lab 1: Complete assignment in ArcGIS Pro, instructions and data are on the Lab Page | None - start Lab 1 |
| 2 - Sept. | Chap 3 | Videos: Goodbye man,
Lecture PDFs (follow) | | | Take Canvas Reading Quiz 1 this week. There is a quiz every week that covers the readings for that week, and it closes Tuesday night of the on-line lecture day. |

http://giscourses.cfans.umn.edu/fnrm3131
Lab Exercises, FNRM 3131, GIS For Natural Resource Management

Resources
- Class Page
- Canvas
- Quick Start - ArcGIS Version 2020 (Read 1st)
- Quick Start - Mac or PC 2020 (Read next)
- Quick Start - Data 2020 (Read next)
- Quick Start - Citrix (Apps To Go) 2020
- Quick Start - ArcGIS Pro Home Install 2020
- Quick Start - Install and log in EDM onto the SFAN Shared Drives

Lab Materials, Organized Chronologically
Readings are from the book "GIS Fundamentals, 6th Edition," by Paul Bolstad

<table>
<thead>
<tr>
<th>Week</th>
<th>Lab Number &amp; Topic</th>
<th>Assignment</th>
<th>Instructional Video ArcGIS</th>
<th>Data (ArcGIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lab 1, Introduction to the software</td>
<td>Lab 1 Instructions</td>
<td>- Simple Overview Lab 1 Part 1</td>
<td>Lab1 Data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Layout &amp; North Arrow</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Legend &amp; Text</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Activate &amp; Zoom Layout</td>
<td></td>
</tr>
</tbody>
</table>

http://giscourses.cfans.umn.edu/labpage-fnrm3131
Class Mechanics

• Reading Quizzes, Assignments, Forums and Online tests on Canvas:

https://canvas.umn.edu
How does the class work?  About your instructors

Where is the material?
The primary source for course material is the class web site or and the textbook. Canvas will only be used to turn in assignments, complete tests/quizzes, and check grades.

Where do I turn in assignments?
We have created a Canvas Dropbox each week, and you will use this Dropbox to submit posts and occasionally other file types as directed.

How do I take Quizzes and Exams?
We have created Reading Quizzes and Exams in Canvas. They will appear in the week they are assigned.

- General Information
- Week 01 Introduction to GIS
- Week 02 Geodesy & Map Projections
- Week 03 Data & Data Entry
- Week 04 GPS, Images, & COGO
- Week 05 Remote Sensing & Digital D...
### Week 03 Data & Data Entry

- **Week 03 - Chapter 4, Reading Quiz**
  - Sep 22 | 6 pts
- **Drop Box for Lab 02**
  - Sep 25 | 8 pts
- **Lab 02 Worksheet Data Entry**
  - Sep 25 | 9 pts
- **Lab 03 Forum**
- **Week 03 - 1st Online Exam, Chapters 2 and 3**
  - Sep 27 | 23 pts
- **First Exam Forum**

### Week 04 GPS, Images, & COGO

- **Week 04 - Chapters 5 & 6 (to page 215), Reading Quiz**
  - Sep 29 | 6 pts
- **Drop Box for Lab 03**
  - Oct 2 | 15 pts
- **Lab 04 Forum**

### Week 05 Remote Sensing & Digital Data, Start Tables

- **Week 05 - Quiz**
  - Oct 5 | 15 pts
<table>
<thead>
<tr>
<th>Week</th>
<th>Assignment Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>Data &amp; Data Entry</td>
</tr>
</tbody>
</table>
|      | Week 03 - Chapter 4, Reading Quiz  
Sep 22 | 6 pts |
|      | Drop Box for Lab 02  
Sep 25 | 8 pts |
|      | Lab 02 Worksheet Data Entry  
Sep 25 | 9 pts |
|      | Lab 03 Forum |
|      | Week 03 - 1st Online Exam, Chapters 2 and 3  
Sep 27 | 23 pts |
|      | First Exam Forum |
| 04   | Week 04 GPS, Images, & COGO |
|      | Week 04 - Chapters 5 & 6 (to page 273), Reading Quiz  
Sep 29 | 6 pts |
|      | Drop Box for Lab 03  
Oct 2 | 15 pts |
|      | Lab 04 Forum |
| 05   | Week 05 Remote Sensing & Digital Data, Start Tables |
|      | Week 05 - Quiz  
Nov 15 | 15 pts |
Add your completed lab assignments as .PDF and when all material is added click "Submit Assignment".
Lab Mechanics

• Labs are due Friday night to Canvas one week after assignment.

• Labs up to 1 week late are penalized 20%

• Labs more than 1 week late are penalized 100%

• Arrange scheduling difficulties in advance
## Course Comprised of Several Parts

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
<th>% total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labs</td>
<td>13 Labs</td>
<td>38.25%</td>
</tr>
<tr>
<td>5 on-line exams (4 regular &amp; Final)</td>
<td></td>
<td>49.18%</td>
</tr>
<tr>
<td>Homework (15 pts)</td>
<td>2 homework's</td>
<td>5.46%</td>
</tr>
<tr>
<td>Quizzes (3 pts)</td>
<td>13 quizzes</td>
<td>7.1%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Note: Optional Lab (.91%), Extra Lab (2.73%), Extra Homework (2.73%), Optional Geocaching (.91%)
Note: running grade totals and your grade for the % of the work you have “turned in”
### Grades for Test Student

**Arrange By**

- Due Date

<table>
<thead>
<tr>
<th>Name</th>
<th>Due</th>
<th>Status</th>
<th>Score</th>
<th>Out of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 01 - Chapters 1 &amp; 2, Reading Quiz</td>
<td>Sep 8 by 11:59 pm</td>
<td>-</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Week 02 - Chapter 2, Reading Quiz</td>
<td>Sep 13 by 11:59 pm</td>
<td>-</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Drop Box for Lab 01</td>
<td>Sep 18 by 11:59 pm</td>
<td>-</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Week 03 - Chapter 4, Reading Quiz</td>
<td>Sep 22 by 6:19 pm</td>
<td>-</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Lab 02 Worksheet Data Entry</td>
<td>Sep 25 by 11:59 pm</td>
<td>-</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Drop Box for Lab 02</td>
<td>Sep 25 by 11:59 pm</td>
<td>-</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Week 03 - 1st Online Exam, Chapters 2 and 3</td>
<td>Sep 27 by 11:59 pm</td>
<td>-</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

**Total: 0%**

<table>
<thead>
<tr>
<th>Group</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>0%</td>
</tr>
<tr>
<td>Reading Quizzes</td>
<td>7.1%</td>
</tr>
<tr>
<td>Lab Assignments</td>
<td>30.06%</td>
</tr>
<tr>
<td>Lab 02 Map Part 01</td>
<td>1.46%</td>
</tr>
<tr>
<td>Lab 02 Data Part 02</td>
<td>1.28%</td>
</tr>
<tr>
<td>Final Lab - Lab 14</td>
<td>5.46%</td>
</tr>
<tr>
<td>Exams 1 to 4</td>
<td>32.79%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>16.39%</td>
</tr>
<tr>
<td>Extra Credit</td>
<td>7.29%</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>5.46%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>107.29%</strong></td>
</tr>
</tbody>
</table>

Uncheck the "Calculate based only on graded assignments" to see your potential final grade (as of that point in time). The percent weighting is on the right.
Grading, Integrity, Ethics

Please note you may work together on labs, but you each must do every part of each lab and turn in entirely your own work. That means each of you should perform every step indicated in the lab manual. Your grade is for individual effort; copied files/maps from other students will be construed as cheating, at a minimum you’ll get zero for the lab, and you may automatically fail the course.

We will try to grade labs within a one-week period, for quick turnaround. However, this won’t happen in all cases. Grading will be on a straight scale, not on a curve. If you all do well, you will all get an A.

The scale is (note: there is no A- grade used in this class):

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 – 100</td>
</tr>
<tr>
<td>B+</td>
<td>88 – 89.99</td>
</tr>
<tr>
<td>B</td>
<td>82 – 87.99</td>
</tr>
<tr>
<td>C+</td>
<td>78 – 79.99</td>
</tr>
<tr>
<td>C</td>
<td>67 – 77.99</td>
</tr>
<tr>
<td>D+</td>
<td>63 – 64.99</td>
</tr>
<tr>
<td>D</td>
<td>50 – 62.9</td>
</tr>
</tbody>
</table>

Grades are shown/reported on your Canvas grades tab.

The required class work (100%) is comprised of: 13 required labs = 38.26%, 2 required homework assignments = 5.46%, 13 on-line reading quizzes = 7.1%, 4 on-line exams = 32.79%, Final = 16.39%.

In addition to the required class work, there are several opportunities to obtain extra credit. These extra credit assignments, if completed, could add an additional 7.29% to your grade.

Note: during the class, when checking your grades on Canvas, please note the checkbox at the bottom of the “Assignments are weighted by group” section; the check box “Calculate based only on the graded assignments” should be UNCHECKED to project your estimated FINAL Grade.

How EXTRA CREDIT is handled in the Grade Book

There are 4 Extra Credit opportunities: A 15-point Extra Credit Homework Quiz, a 15-point Extra Credit Lab, a 5-point Extra Credit GPS Lab and 5 possible points for “hiding” Geocaches. These points **COULD** total up to 40 Extra Credit points. These 40 points amount to an extra 7.29% of the graded class assignments.

How this Works

Extra Credit (optional, extra credit opportunities): If all extra credit is completed, you would receive and EXTRA 7.29% of the regular class. Extra Credit is Awarded IN ADDITION to the regular class work.

Extra Credit will appear in the Student Grade Book throughout the class as 0% **UNTIL** the final grade calculation at the end of the class. (See the Grade Book Section “Assignments are weighted by group”). When the final grades are calculated we will enter “C” in all unsubmitted Extra Credit Assignments and change the Extra Credit Group percent (%) to 7.29%. So, at the very end of the class the TOTAL possible percent will display as 107.29%.

If you do complete one or more Extra Credit Assignments during the class, your points will be recorded, as they are submitted & graded, and **WILL NOT be included in your Total % column** until the final grade calculation at the end of the class. If you wish to CALCULATE BY HAND the value of your Extra Credit work prior to the end of the class, do the following: take your graded Extra Credit Points and divide them by 40 and then multiply the result by 7.29. This calculation will allow you to predict the extra % that will be added to your total percent (as displayed in the Grade Book during the class). At the end of the class, we will do this same calculation in the grade book and improve your total percent position by whatever percent of Extra Credit you achieved.

For example, say you did 30 of the possible 40 extra credit points: (23/40) * 7.29 = 3.845
3.845% would then be ADDED to your regular class work percentage at the final grade calculation.
## Grading - Straight Scale

<table>
<thead>
<tr>
<th></th>
<th>A+</th>
<th>B+</th>
<th>C+</th>
<th>D+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt;100%</td>
<td>87.5 – 89.99</td>
<td>77.5 – 79.99</td>
<td>60.0 – 64.49</td>
</tr>
<tr>
<td>A</td>
<td>90-100</td>
<td>82.5 – 87.49</td>
<td>70.0 – 77.49</td>
<td>50.0 – 59.99</td>
</tr>
<tr>
<td>A-</td>
<td>Not given</td>
<td>80-82.49</td>
<td>65 – 69.99</td>
<td>&lt; 50%</td>
</tr>
</tbody>
</table>
Other information

Andrew Jenks Shared Evernote “notebooks"

https://www.evernote.com/pub/andyjenks/gismapsgeneral

https://www.evernote.com/pub/andyjenks/gis-umn