FNRM 3131
Introduction to GIS in Natural Resource Management

Instructors: Andrew C. Jenks
215 Green Hall
ajenks@umn.edu, @acjenks
Paul V. Bolstad
301J Green Hall
pbolstad@umn.edu
FNRM 3131
Introduction to GIS in Natural Resource Management

Instructors: Andrew C. Jenks
215 Green Hall
ajenks@umn.edu, @acjenks
Paul V. Bolstad
301J Green Hall
pbolstad@umn.edu

Office Hours (Green 215)
12-1:50 p.m. Tuesdays & Thursdays
8-9 p.m. Wednesday via (Google Hangouts; link on class website)
Objectives for Today

- Mechanics and grading
- Content
- Motivation
Introduce Vocabulary, Methods & Technology
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
FNRM 3131
Introduction to Geographic Information System (GIS) for Natural Resources

- Offered both **On-Line** and **In-Person**

- Class based around textbook written by one of the course instructors for **this specific class**.

- Lab exercises apply the concepts covered in text.

- Students can access **all** of the class material On-Line, In-Person or any combination of the two.

- If you change how **you** access the class you do not need to change your registration
Resources

Software

Three choices (you can switch at anytime)

1. Use Skok 35 computer lab.

2. Use virtual network connection into UMN network (Citrix/Apps to Go).

3. 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 an Internet connection
Class Mechanics

Lecture and Lab each week.
Tests every 2-3 weeks
covering reading/lecture
topics

• Do readings in advance for both lectures and labs
• 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)

## Need Help?
- In-person help: Office Hours: Tuesdays and Thursdays, 12-1:50 p.m. in 215 Green Hall
- Online help: [Google Hangout for Wednesdays 8-9 pm (CST)](click the link to connect)
- Email: ajanski@umn.edu
- General technology help: UofM Technology Help Desk

## Materials, Organized Chronologically
Readings are from the book "GIS Fundamentals, Sixth Edition" by Paul Bolstad

<table>
<thead>
<tr>
<th>Week of</th>
<th>Chapters</th>
<th>Class Notes, Videos</th>
<th>Supplements</th>
<th>Lab Assignment</th>
<th>Assignments Due, Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Sept. 2</td>
<td>Chap 1, 2</td>
<td>Introduction to GIS Videos: Course Mechanics Introduction, Basic Concepts, Raster Structure and Resampling, Data and File Structures, Coord. Questions Lecture PDFs 1 2</td>
<td>Geospatial Revolution, Notes-GIS Links, Notes-Links, 3 trillion trees, What 3 Words</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>2-Sept. 9</td>
<td>Chap 3</td>
<td>Videos: Geodesy, map projections Lecture PDFs</td>
<td>Understanding Map Projections</td>
<td>Lab 2, Geodesy, Coordinate Systems, Map Projections, Lab</td>
<td>1) Complete Canvas Quiz 2, it closes at the start of Tuesday lecture</td>
</tr>
</tbody>
</table>

[http://giscourses.cfans.umn.edu/fnrn3131](http://giscourses.cfans.umn.edu/fnrn3131)
Department of Forest Resources  
University of Minnesota  

FNRM 3131  
Lecture: Tuesday & Thursday, 1:55 – 2:45 p.m., 110 Green Hall, and one of the following:  
8:30 a.m. – 10:25 a.m.  Wednesday 35 Skok  Section 4  
12:50 p.m. – 2:45 p.m.  Wednesday 35 Skok  Section 2  
9:35 a.m. – 11:30 a.m.  Thursday 35 Skok  Section 3  
On-line Lab  (you can also come to any in-person lab session if/as needed)  Section 5, 21  
On-line Lecture  (see Class Website)  (you can also come to any in-person lecture if/as needed)  Section 20

Instructors:  
Andrew C. Jenks  
215 Green Hall, 651-387-9600  
ajenks@umn.edu

Paul Bolstad  
301H Green Hall, 612-624-9711  
pbolstad@umn.edu

Office Hours:  
Tuesday/Thursday, 12-1:50 pm (Green 215) & Google Hangouts Wed. 10am-3pm

Required Texts:  
GIS Fundamentals: A First Textbook on Geographic Information Systems, Sixth Ed., Bolstad, Paul V. XanEdu Publishing 2019. This book is on reserve in the Natural Resources Library 3rd floor and should be at the St. Paul Campus bookstore and at the website https://www.xanedu.com/higher-education/our-products/college-books-catalog/gis_fundamentals_6e/. 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. You should do the readings before class meets; there is a quiz each week prior to start of each Tuesday lecture on the week’s reading assignment.

Required Materials:  
You may download and print the exercises as PDFs from the class website, http://giscourses.cfans.umn.edu/fnrm3131. Throughout the labs sessions you will need to save/backup your work. You will be provided UMN class disk space, L:\home\(your id), used it for your work.

Other Resources:  
The class website is http://giscourses.cfans.umn.edu/fnrm3131. This website has copies of this syllabus, and lab exercises. A related website, http://paulbolstad.net/gisbook.html has information on the textbook.

Student Responsibilities:  
You should attend the lectures (or access on-line lecture materials), do the readings, do assigned lab and homework problems submit them via Moodle; complete all quizzes and exams via Canvas. All material from lectures and readings may appear on the examinations.

If you need any assistive devices, services, or accommodations, due to a disability, please contact the instructor.
# Lab Exercises, FNRM 3131, GIS For Natural Resource Management

## Resources
- Class Page
- Canvas
- Quick Start - ArcGIS Versions 2019 (Read 1st)
- Quick Start - Mac or PC 2019 (Read next)
- Quick Start - Data 2019 (Read next)
- Quick Start - Citrix (Apps To Go) 2019
- Quick Start - ArcGIS Pro Home Install 2019
- Quick Start - Install and use VPN to map to CFAN Shared Drives

## Lab Materials, Organized Chronologically

Readings are from the book "GIS for Natural Rock Resources, 2nd Edition," by Paul Bolstad

<table>
<thead>
<tr>
<th>Week</th>
<th>Lab Name &amp; Topic</th>
<th>Assignment</th>
<th>Instructional Video ArcGIS</th>
<th>Data (ArcGIS)</th>
</tr>
</thead>
</table>
| 1    | Lab 1, Introduction to the software | Lab 1 Instructions | - StartArcGisProj1stTime  
- Layout&NorthArrow  
- Legend&Text  
- Activate & Zoom Layout  
- MeasureTool  
- ScaleBar  
- Symbols  
- Unique_Symbols  
- Export_Map | Lab1 Data |
| 2    | Lab 2, Coordinate Systems (optional) | | | |
Class Mechanics

- Reading Quizzes, Assignments, Forums and On-line tests on Canvas:
  https://canvas.umn.edu
FNRM 3131 (All Sections) Geographical I...

How does the class work?

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

Where do I sign in assignments?
We have created a Canvas Dropbox each week, and you'll use this Dropbox to submit pdfs 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.

- Week 01 No Class due to Univer...
- Week 02 Introduction to GIS
- Week 03 Geodesy & Map Project..
- Week 04 Data & Data Entry
- Week 05 GPS, Images, & COGO
- Week 10 Raster
- Week 11 Terrain
- Week 12 Interpolation
- Week 13 Thanksgiving
- Week 14 Cartographic Models
<table>
<thead>
<tr>
<th>Assignment</th>
<th>Date</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop Box for Lab 01</td>
<td>Sep 14</td>
<td>15 pts</td>
</tr>
<tr>
<td>Lab 02 Forum</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 03, Data &amp; Data Entry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 03 - Chapter 4, Reading Quiz</td>
<td>Sep 18</td>
<td>6 pts</td>
</tr>
<tr>
<td>Drop Box for Lab 02</td>
<td>Sep 21</td>
<td>8 pts</td>
</tr>
<tr>
<td>Week 03 - Lab 02 Worksheet Data Entry</td>
<td>Sep 21</td>
<td>9 pts</td>
</tr>
<tr>
<td>Lab 03 Forum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 03 - 1st Online Exam, Chapters 2 and 3</td>
<td>Sep 23</td>
<td>23 pts</td>
</tr>
<tr>
<td>First Exam Forum</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 04, GPS, Images, &amp; COGO</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 04 - Chapters 5 &amp; 6 (to page 27!), Reading Quiz</td>
<td>Sep 25</td>
<td>6 pts</td>
</tr>
<tr>
<td>Drop Box for Lab 03</td>
<td>Sep 28</td>
<td>15 pts</td>
</tr>
</tbody>
</table>
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></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></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

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

Canvas Grade screen: keep track of your points/grade

<table>
<thead>
<tr>
<th>Name</th>
<th>Due</th>
<th>Score</th>
<th>Out of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 02 - Chapter 3, Reading Quiz</td>
<td>Sep 10 by 11:59pm</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Drop Box for Lab 01</td>
<td>Sep 13 by 11:59pm</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Week 03 - Chapter 4, Reading Quiz</td>
<td>Sep 17 by 11:59pm</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Lab 02 Workshop Data Entry</td>
<td>Sep 20 by 11:59pm</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Drop Box for Lab 02</td>
<td>Sep 20 by 11:59pm</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Week 03 - 1st Online Exam, Chapters 2 and 3</td>
<td>Sep 22 by 11:59pm</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Week 04 - Chapters 5 &amp; 6 (to page 273), Reading Quiz</td>
<td>Sep 24 by 11:59pm</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Drop Box for Lab 03</td>
<td>Sep 27 by 11:59pm</td>
<td>15</td>
<td>4</td>
</tr>
</tbody>
</table>
The percent weighting is on the right.

Also: Uncheck the "Calculate based only on graded assignments" to see your potential final grade (as of that point in time).

<table>
<thead>
<tr>
<th>Name</th>
<th>Due</th>
<th>Score</th>
<th>Out of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 02 - Chapter 3, Reading Quiz</td>
<td>Sep 10 by 11:59pm</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Drop Box for Lab 01</td>
<td>Sep 13 by 11:59pm</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Week 03 - Chapter 4, Reading Quiz</td>
<td>Sep 17 by 11:59pm</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2019-2020 Worksheet Data Entry</td>
<td>Sep 20 by 11:59pm</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Drop Box for Lab 02</td>
<td>Sep 20 by 11:59pm</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Week 03 - 1st Online Exam, Chapters 2 and 3</td>
<td>Sep 22 by 11:59pm</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Week 04 - Chapters 5 &amp; 6 (to page 273), Reading Quiz</td>
<td>Sep 24 by 11:59pm</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Drop Box for Lab 03</td>
<td>Sep 27 by 11:59pm</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>
## Grading - Straight Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>&gt;100%</td>
</tr>
<tr>
<td>B+</td>
<td>87.5 - 89.99</td>
</tr>
<tr>
<td>C+</td>
<td>77.5 - 79.99</td>
</tr>
<tr>
<td>D+</td>
<td>60.0 - 64.49</td>
</tr>
<tr>
<td>A</td>
<td>90-100</td>
</tr>
<tr>
<td>B</td>
<td>82.5 - 87.49</td>
</tr>
<tr>
<td>C</td>
<td>70.0 - 77.49</td>
</tr>
<tr>
<td>D</td>
<td>50.0 - 59.99</td>
</tr>
<tr>
<td>A-</td>
<td>Not given</td>
</tr>
<tr>
<td>B-</td>
<td>80-82.49</td>
</tr>
<tr>
<td>C-</td>
<td>65 - 69.99</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 50%</td>
</tr>
</tbody>
</table>
Andrew Jenks Shared Evernote “notebooks"

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

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