**Catalog Listing:** CE 576 Engineering Applications of Geographic Information Systems and Global Positioning Systems. Apply the concepts of GIS and GPS to engineering application with the emphasis on a case study.

**Term to be offered:** Fall

**Prerequisites:** Senior Standing, Engineering Major or Consent

**Instructors:** Dr. Mazdak Arabi  
Office: A207F Engineering Building  
Office Hours: T TH 1:00 - 2:00 pm  
Phone: (970) 491-4639  
E-mail: Mazdak.Arabi@Colostate.edu

**TA/IA:** Ali Tasdighi  
Office: C211  
E-mail: tasdighi.a@gmail.com

**Textbooks [optional]:**  
- Softcover available for ~ $50, from amazon.com.

- DRM digital version available, $25, from CafeScribe here, or go to the cafescribe.com website and search for Paul Bolstad.

"GIS Tutorials 2, Spatial Analysis Workbook", 2010, ESRI Press, by David Allen

**Other Material:**  
ESRI Virtual Campus Courses:  
- Learning ArcGIS Desktop (for ArcGIS 10)  
- Creating, Editing, and Managing Geodatabases for ArcGIS Desktop  
- Learning ArcGIS Spatial Analyst  
- Working with Rasters in ArcGIS Desktop  
- Creating and Maintaining Metadata Using ArcGIS Desktop

**Grading:**  
1) Labs/HW 60%  
2) Project 25%  
3) Exam 15%
Objectives:
At the end of this course you will understand:
- the principles of geographic analysis
- various techniques for data collection, organization, and visualization
- methods for the analysis of spatial data and patterns

Tentative Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction and basic concepts</td>
</tr>
<tr>
<td>2</td>
<td>Representing geography/data models</td>
</tr>
<tr>
<td></td>
<td>The nature of geographic data</td>
</tr>
<tr>
<td>3</td>
<td>Georeferencing/Coordinate systems and projections</td>
</tr>
<tr>
<td>4</td>
<td>Spatial data models</td>
</tr>
<tr>
<td>5-6</td>
<td>GIS data collection/GPS</td>
</tr>
<tr>
<td>7</td>
<td>Creating and maintaining geographic databases</td>
</tr>
<tr>
<td>8</td>
<td>Cartography and map production</td>
</tr>
<tr>
<td>9</td>
<td>Query, measurement and transformation</td>
</tr>
<tr>
<td>10-11</td>
<td>Classification, extraction, overlay and proximity</td>
</tr>
<tr>
<td>12</td>
<td>Spatial analysis based on raster data processing, spatial statistics</td>
</tr>
<tr>
<td>13</td>
<td>Geoprocessing</td>
</tr>
<tr>
<td>14-15</td>
<td>Geostatistical analysis, analyzing patterns</td>
</tr>
<tr>
<td>16</td>
<td>Other dimensions, other tools, other solutions</td>
</tr>
</tbody>
</table>

Final examination: Dec 16, 4:10-6:10p
Course project due date: Dec. 9, 4:30p

Checking your assignment attachments
Once you have completed an assignment and included your attachment(s), you will upload it to RamCT. Ideally your assignment will include your attachment without problems. However sometimes things just don’t work as expected. It is important that you check your submitted assignments to make sure the attachment is included. Go to Assignments and select the Submitted tab. You should see your assignment. Click on the assignment to view it. You will be able to see if the attachment is included. If the attachment is not shown, take the submission back to the Inbox, add the attachment and resubmit the assignment. **It is your responsibility to make sure the attachment is included.**

Taking back and resubmitting your assignment attachments
Suppose you made changes or modifications to the assignment and want to upload the new version. Before you can upload the new version you must remove the previous file. Begin by going to Assignments and select the Submitted tab. Next to the assignment you have a drop down tab. Click the
drop down tab and choose Take Submission Back to Inbox. Once you choose Take Submission Back to Inbox, you will be able to click on the assignment in the Inbox. You will see the following screen where next to the name of the file you attached you will see an arrow. Clicking on the arrow will allow you to remove your attachment.

General Class Policies

You are expected to:

• **Attend regularly:** It is recommended that you attend each class because important information will be covered in class that will help you with the laboratory assignments, homework, and exams. Also, if changes in exam procedure, exam date, exam coverage, assignments, etc. are announced in class you are responsible for knowing this information. Unannounced “pop” quizzes will be given in lecture, and unless you provide a doctor’s note for illness, you will receive a zero for these quizzes if you are not present. You must either arrange with the professor ahead of time if you will miss class or lab for a legitimate reason (e.g., surgery, funeral, or university-sanctioned activity), or provide a doctor’s note if you could not notify the professor ahead of time because of illness, otherwise, you will receive a zero on any quizzes or assignments due that day or for that laboratory.

• **Access RamCT regularly:** The RamCT course site will be updated regularly with Power Point handouts and other materials presented in class. The lecture handouts should be printed and brought to class. The class schedule and due dates for assignments will be regularly posted and updated. It is your responsibility to be aware of this information. Anything that is posted on RamCT and covered in class is likely to be subject to questions on the midterm and final.

• **Arrive on time:** Coming late to class causes a disturbance and is disrespectful to others. Please do not enter or leave the room while the class is in progress, except in the case of an emergency. Pop quizzes will likely be given at the very beginning or the very end of lecture, so it is to your advantage to arrive on time and stay until the end of class.

• **Turn off your cell phones and beepers** before the start of class. If you have a special need to have it on, please visit with one of the professors to discuss the matter.

• **Respect assignment deadlines:** Assignments have to be submitted at the **beginning** of a class or lab period on the due date. If you turn in your homework at the end of class or lab you will receive a 50% penalty. If you do not submit your assignment on the day it is due, you will receive a zero for that assignment. In case of an emergency please contact one of your instructors.

• **Be honest:** CSU Policies and Guiding Principles will be strictly enforced. All CSU students are responsible for knowing and adhering to the academic integrity policies of this institution. Violations of this policy may include: cheating, plagiarism, aiding academic dishonesty, fabrication, lying, bribery, and threatening behavior. Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion).

• **Adhere to CSU sexual harassment policy:** CSU sexual harassment policy will be strictly enforced. The CSU policy on sexual harassment applies to all students, staff and faculty. Sexual harassment is unwelcome sexual attention. It can involve intimidation, threats, coercion, or promises or create an environment that is hostile or offensive.