GEOG 5225 – Geographic Applications of Remote Sensing

Instructor
Prof. Desheng Liu
Email: liu.738@osu.edu
Office: 1189 Derby Hall
Phone: 614-247-2775
Office Hours: Monday 2:00-3:30PM or by appointment

Teaching Assistant
Mr. Rohit Mukherjee
Email: mukherjee.110@buckeyemail.osu.edu
Office: 1145 Derby Hall
Office Hours: WeTh 10:00-11:00AM, or by appointment

Lectures/Labs
0135 Derby Hall, TuTh 11:10-12:30PM

Course Website
The course schedule, announcements, lecture notes, lab assignments, readings, and other course information will be posted on Carmen (https://carmen.osu.edu).

Course Description
This course provides an introduction to the fundamentals of remote sensing and its geographic applications. Lectures will focus on basic concepts and techniques in remote sensing data acquisition and analysis. Examples from a variety of topical areas will be used to illustrate how the information derived from remotely sensed data can be used in geographic studies. Computer laboratory exercises are designed to help students to gain hands-on experiences on the digital processing of remotely sensed data. Students are expected to complete a project that applies remote sensing techniques to solve a real-world problem.

Required Textbook

Optional Reference
Course Evaluation

Final course grades will be based on the following weighting of assessment components:

- **Participation (20%)**: Class attendance and participation is expected for all students. Students will receive credits for participating in-class activities including class exercises, presentations, and discussions.

- **Laboratory exercises (35%)**: The laboratory exercises will require the use of ERDAS Imagine. All lab assignments should be turned in on time. Late submissions will be penalized by 10% per day late.

- **Examination (15%)**: There will be an in-class examination in the second half of the semester. The exact exam date depends on the actual course progress and will be announced later. Students must take the exam to receive credits. No make-up exam will be given unless legitimate documents for medical or personal emergency are presented prior to the exam.

- **Final project (30%)**: Students are required to complete a final project that applies remote sensing techniques to solve a real-world problem of their own interest. More detailed information on the final project will be discussed in class.

Final course grades will be assigned based on the following grading scale:

- **A**: 93–100 | **A-**: 90–92 | **B+**: 87–89 | **B**: 83–86 | **B-**: 80–82 | **C+**: 77–79
- **C**: 73–76 | **C-**: 70–72 | **D+**: 67–69 | **D**: 60–66 | **F**: below 60

Student Responsibility

You are responsible for your own learning. I am here solely to facilitate your learning. I will help you as much as I can, but learning the material is ultimately up to you. This includes:

- Attending class meetings or getting notes from others if you miss class;
- Asking questions when you have them, either in class or out of class;
- Doing the assignments on time and participating in class;
- Contacting me if you have difficulties.

Communication Devices

Cell phones and other communication devices must be either turned off or put on vibrate during class. Please refrain from texting during class as a courtesy to those sitting around you. All electronic devices other than a calculator must be shut off and put away during examinations.

Academic Misconduct

Please help maintain an academic environment of mutual respect and fair treatment. It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term academic misconduct includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest
practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). Academic misconduct will not be tolerated and will be dealt with procedurally in accordance with university policy, which is available at http://oaa.osu.edu/coam.html. For additional information, see the Code of Student Conduct at http://studentlife.osu.edu/csc/.

Disability Services

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Receiving an ‘I’ for the Course

You cannot receive an incomplete for the course unless 70% of the work in the course has been completed. Extenuating circumstances will be handled on a case-by-case basis.

Weekly Topics

A tentative outline of weekly topics is given below. Students should check the course website frequently for updates.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>Ch. 1</td>
</tr>
<tr>
<td>2</td>
<td>Remote sensing basics</td>
<td>Ch. 1, Ch. 2</td>
</tr>
<tr>
<td>3</td>
<td>Remote sensing systems</td>
<td>Ch. 2</td>
</tr>
<tr>
<td>4</td>
<td>Image statistics</td>
<td>Ch. 4</td>
</tr>
<tr>
<td>5</td>
<td>Image preprocessing: radiometric correction</td>
<td>Ch. 6</td>
</tr>
<tr>
<td>6</td>
<td>Image preprocessing: geometric correction</td>
<td>Ch. 7</td>
</tr>
<tr>
<td>7</td>
<td>Image enhancement</td>
<td>Ch. 8</td>
</tr>
<tr>
<td>8</td>
<td>Classification overview</td>
<td>Ch. 9</td>
</tr>
<tr>
<td>9</td>
<td>Classification algorithms</td>
<td>Ch. 9</td>
</tr>
<tr>
<td>10</td>
<td>Accuracy assessment</td>
<td>Ch. 13</td>
</tr>
<tr>
<td>11</td>
<td>Change detection</td>
<td>Ch. 12</td>
</tr>
<tr>
<td>12</td>
<td>Remote sensing applications</td>
<td>Assigned reading</td>
</tr>
<tr>
<td>13</td>
<td>Remote sensing applications</td>
<td>Assigned reading</td>
</tr>
<tr>
<td>14</td>
<td>Remote sensing applications</td>
<td>Assigned reading</td>
</tr>
<tr>
<td>15</td>
<td>Final project</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Final project</td>
<td></td>
</tr>
</tbody>
</table>