Remote Sensing, Fall 2011

GISC 4431 – 4 credits

I. COURSE INFORMATION
Meeting times and place: LEC: MW 1:00 – 2:15 CI 229
LAB: F 9:00 – 11:50 a.m. CI 229
Professor: Dr. Peter Kuntu-Mensah
Office/Phone: Room CBI 105, 825-3419
e-mail address: peter.kuntu-mensah@tamucc.edu
Office hours: M, W: 9:00 a.m. -11:00 a.m., F: 12:00-1:00 p.m. and by appointment

II. COURSE DESCRIPTION
This course will introduce students to the fundamental concepts of aerial photography interpretation, photogrammetry and Remote Sensing. Students will learn about the acquisition, manipulation, and interpretation of global data sets acquired in the visible to microwave portion of the electromagnetic spectrum from orbital platforms. Students will gain the requisite understanding to apply remote sensing systems and techniques to any particular application of interest.

III. LEARNING OBJECTIVES
At successful completion of this course the student will be able to:

- Define key terms used in Photogrammetry and Remote Sensing
- Understand the basic physics of electromagnetic energy and principles used in remote sensing
- Identify/utilize instruments and equipment used in Remote Sensing and Photogrammetry
- Students will understand concept of Aerial Photo interpretation and Remote Sensing
- Students will understand the physics Electromagnetic Energy and application in Remote Sensing
- Students will understand EM interaction with atmosphere and earth features and how the uniqueness of spectral characteristics of every feature is used to distinguish them
- Student will understand acquisition, manipulation, and interpretation of global data sets
- Student will analyze RS data-using visual techniques and through digital image processing
- Students will create map products using principles of DIP

IV. PREREQUISITES FOR COURSE
Prerequisite: GISC 3421

V. TEXT AND OTHER REQUIREMENTS
Required: Remote Sensing and Image Interpretation, 6ed, Lillesand, Keifer, Chipman, Wiley

VI. INSTRUCTIONAL METHODS AND ACTIVITIES
Lectures, labs, homework assignments, use of relevant software
VII. EVALUATION AND GRADE ASSIGNMENT
The final grade will be based on the weighted average composite percentages of the following:
1. Labs, homework assignments  40%
2. One Mid-term  30%
3. Final Comprehensive exam  25%
4. Attendance& Portfolio  5%

COURSE OUTLINE**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Text</th>
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<tbody>
<tr>
<td>1&amp;2</td>
<td>Course Introduction, History of Remote Sensing and Photogrammetry; Satellite Platforms, aerial photography</td>
<td>Ch. 1</td>
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<td>Lab 1: Getting to Know Erdas Imagine software</td>
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<td>3</td>
<td>Energy sources and Electromagnetic Radiation principles</td>
<td>Ch. 1</td>
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<td>Lab2: EM Energy computations</td>
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<td>4</td>
<td>Energy Interactions, Data Acquisitions, Interpretations, Characteristics of Remote Sensing Systems</td>
<td>Ch. 1</td>
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<td>Lab3: Spectrometry</td>
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<td>5 &amp;6</td>
<td>Aerial photography, Photographic systems</td>
<td>Ch.2, Ch.3</td>
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<td>Elements Visual Interpretation</td>
<td>Ch 4</td>
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<td>Lab 4: Photo Interpretation</td>
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<td>7&amp;8</td>
<td>Elements of Visual Interpretation</td>
<td>Ch. 4</td>
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<td>Lab 5: Erdas Imaging -</td>
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<td>Exam Review – Exam 1</td>
<td>Ch. 1,2 3,4</td>
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<td>9</td>
<td>Multi-Spectral, Thermal and Hyperspectral Sensing</td>
<td>Ch. 5</td>
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<td>10</td>
<td>Digital Image Analysis – Preprocessing</td>
<td>Ch. 7</td>
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<td>Lab6: Erdas Imagine</td>
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<td>11</td>
<td>Digital Image Analysis - Feature Extraction</td>
<td>Ch. 7</td>
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<td>Lab7: Erdas Imaging</td>
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<td>12</td>
<td>Digital Image Analysis - Image Classification</td>
<td>Ch. 7</td>
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<td>Lab 8: Erdas Imaging - Project</td>
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<td>13</td>
<td>Earth Resource Satellites -Imagery and applications</td>
<td>Ch. 6</td>
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<td>15</td>
<td>Photomaps; mosaic; Orthophoto</td>
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<td>Lab 9: Stereo Viewing</td>
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<td>16</td>
<td>Introduction to Digital Photogrammetry</td>
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<td>Lab10: Erdas LPS</td>
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<tr>
<td>17</td>
<td>Introduction to Lidar Systems</td>
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** May be subject to change

Notice to Students with Disabilities: Texas A&M University-Corpus Christi complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. If you suspect that you may have a disability (physical impairment, learning disability, psychiatric disability, etc.), please contact the Services for Students with Disabilities Office, located in Driftwood 101, at 825-5816. If you need disability accommodations in this class, please see me as soon as possible.
ACADEMIC ADVISING: The College of Science and Technology requires that students meet with an Academic Advisor (Ms. Ida Olivarez. Office: FC 168. Phone: 825-5797. Zip+4: 5806. URL: http://www.sci.tamucc.edu/camsadvising/. Email: ida.olivarez@tamucc.edu) as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair.

Grade Appeal Process. As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

GENERAL GUIDELINES FOR COURSES AND LABS
IN THE GISC PROGRAM
CULTURE, REGULATIONS, MODES OF OPERATION AND PROCEDURES

These guidelines are designed to inform scholars of their responsibilities and of the course requirements in order to make this course a positive experience. The instructor is always available for consultation and discussion with students on any aspect of a course and of these general guidelines.

CLASS CULTURE

1. Consider yourself as a scholar rather than a student. The term “student” may imply some passivity, whereas the term “scholar” implies active participation, understanding and searching. We will use these terms interchangeably with the meaning of “scholar” implied. Osmosis does not work in a learning environment!

A good scholar takes NOTES at every class meeting.

2. Further, define yourself as a “thinking explorer”. You are responsible for your education; an instructor can only be a guide and a facilitator. An instructor cannot learn for you. If you come across something that really interests you, explore it further.

3. Your experience at this University should not consist of passing a series of courses to earn a degree. Your experience should rather be a series of activities that will give you an education.

4. Concentrate on “learning to learn”. You will have to be a life-long learner to survive in your chosen career.

5. There is no such thing as a stupid question; there is such a thing as a stupid answer. So ask questions, the instructor is taking all the risks! Ask questions of your instructor and of your fellow scholars. Many times questions are more important than answers.

6. Keep copious notes of all that is going on in all the meetings related to your course. Make a note of what the instructor is stressing. At the end of each lecture you should be able to answer two questions: What did I learn from this lecture? and What was not clear to me? At the beginning of each lecture, if the instructor does not ask for questions, you need to ask if there is something you did not understand from the last lecture. Review, consolidate, annotate and organize your lecture/lab notes on a regular basis, at least once a week. The Internet is a
tremendous resource and also a great danger. When you find information on the Internet, you have no idea if it is correct. View such information with caution. But, use the Internet to explore topics that interest you. Do not only prepare for the exam in a course – learn as much as you can on the topics introduced to you by the course material. You are responsible for the extent of your education! **READ MINDFULLY !!!!!**

7. In addition to details of the syllabus given in class, the syllabus for the course includes all the chapters of the required textbook/s unless indicated otherwise by the instructor. The student is responsible for all materials/topics covered in class, in handouts, in assignments, in labs, and in outings or field trips. The instructor is NOT responsible for informing absent students exactly what was covered in previous classes, meetings, etc.

**PROCEDURES & REGULATIONS**

8. The final letter grade for the class will be based on the raw composite numerical score obtained from the weighted average of the tests, quizzes, exams, labs, etc. as indicated by the instructor. The raw composite numerical score may be adjusted (curved) based on the highest score, the statistical profile of the scores and other academic standards or other considerations. Generally the letter grade of A is 90% and over of the adjusted score, a B is between 80% and 89% (inclusive) of the adjusted score, a C is between 70% and 79% (inclusive) of the adjusted score, a D is below 70% of the adjusted score and an F is below 60% of the adjusted score. An incomplete (I) will only be given in very unusual circumstances. The University regulations on incomplete grades state: “An incomplete notation may be given to a student who is passing but has not completed a term paper, examination, or other required work for reasons beyond the student’s control other than the lack of time”. Students are expected to take ALL tests, quizzes, exams, etc., and to complete and hand in all labs and other assignments. There is no provision for “extra credit”. No final grades will be given via the telephone, e-mail, etc.

9. All University rules, regulations and expected student conduct apply to this course. Students are held responsible for the information given in the current Catalog and Student Handbook. Make yourself aware of the University security regulations.

10. All labs, assignments, etc. must be handed in on the assigned due date. Scholars having problems **must notify the instructor** well before the due date. Marks will be deducted for poor and sloppily presented work.

11. Labs, etc. handed in after the due date may be subject to a penalty of loss of marks. Labs, etc. handed in **after the graded labs**, etc. have been returned to students will get **zero marks** but must be handed in to the instructor. Labs will be returned to students, after they have been graded, at a class meeting. Students who miss this meeting will be able to collect graded work in the marked box outside the instructor’s office.

12. Scholars are asked to take special note of the penalties, which the University attaches to Academic Dishonesty. Consult the Student Handbook.

13. All work handed in to the instructor must be the student’s own work. Extracts, excerpts, etc. from the work of others must be suitably noted, acknowledged and properly referenced. Any Group Work will be judged in the same way. That is, it is the work of the group and the extracts, excerpts, etc. of others must be acknowledged.

14. All written and graphical work handed in must be presented neatly printed and bound (staples are adequate). Students’ written work will be judged on written communication skills, critical thinking and problem solving ability.

15. Students are expected to be **present at all meetings** (lectures, labs, etc.) of the class. Students are expected to be present at the date and time assigned for all tests, exams, quizzes, etc. There are NO provisions for making up missed exams except in cases where prior arrangements have been made and **agreed to by the instructor**. During the assigned lab session, ONLY assigned labs are to be done. All other work must be done in other rooms.

16. All **cellular phones** and other similar devices MUST BE TURNED OFF during lectures, labs and other class meetings.
17. All students must keep their university e-mail addresses (firstname.lastname@islander.tamucc.edu). This will be the means of communication between the instructor and the class.

18. The instructor reserves the right to make changes to the above with due notice to the students. These changes will be announced in class and each student is responsible for keeping herself/himself informed of such changes.