FNR 55800: Digital Remote Sensing and GIS
2015

Instructor: Guofan Shao, Office: PFRN 221B, Phone: 43630
E-mail: shao@purdue.edu

Class Goals:
♦ Practice advanced digital remote sensing and raster GIS technologies and their applications in Earth environment.
♦ Learn important theories and methods of image data processing and GIS functionalities.
♦ Independently perform image data analysis with Erdas Imagine.
♦ Master skills that lead to correctly and accurately apply various geospatial data products.

References:

Internet Materials:

Lecture: Two lecture meetings per week: Tuesday and Thursday 11:30 – 12:20, PFEN 203

Lab: One lab per week: Wednesday 1:30 – 4:20 pm, PFEN 202

Under Campus Emergency:
In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Contact instructor to get information about changes in this course.

Office Hours:
Students may stop by instructor’s office any time, and the instructor will see students as long as he is neither with someone nor rushing to finish something.

Grading (Lecture-Lab Module):

<table>
<thead>
<tr>
<th></th>
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<th>Points</th>
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<tbody>
<tr>
<td>Exams</td>
<td>50 + 50</td>
<td>100</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20 X 5</td>
<td>100</td>
</tr>
<tr>
<td>Projects</td>
<td>75 + 75 + 100</td>
<td>250</td>
</tr>
<tr>
<td>Labs</td>
<td>10 X 8</td>
<td>80</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>530</strong></td>
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Deductions:
1. 10 points deduction for a class absence without a reason*
2. 10 points deduction for a lab absence without a reason*
3. 10 points deduction for not turning in a homework on time
4. 100% deduction for not finishing a class project on time
5. 100% deduction for not taking a quiz or exam without a reason*
* including reasons beyond student’s control (e.g., illness, family emergency, bereavement, etc.).

Grading Scale: Total number of points for each student will be converted into a 100 scale. Grade will be given according to this table:

<table>
<thead>
<tr>
<th>Grade</th>
<th>GPA Value</th>
<th>Range</th>
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<tbody>
<tr>
<td>A+, A</td>
<td>4.0</td>
<td>93-100</td>
</tr>
<tr>
<td>A-</td>
<td>3.7</td>
<td>90.0 - 92.9</td>
</tr>
<tr>
<td>B+</td>
<td>3.3</td>
<td>87.0 - 89.9</td>
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<tr>
<td>B</td>
<td>3.0</td>
<td>83.0 - 86.9</td>
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<tr>
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<tr>
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</tr>
<tr>
<td>C</td>
<td>2.0</td>
<td>73.0 – 76.9</td>
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<tr>
<td>C-</td>
<td>1.7</td>
<td>70.0 – 72.9</td>
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<tr>
<td>D+</td>
<td>1.3</td>
<td>67.0 – 69.9</td>
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<tr>
<td>D</td>
<td>1.0</td>
<td>63.0 – 66.9</td>
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<tr>
<td>D-</td>
<td>0.7</td>
<td>60.0 – 62.9</td>
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<tr>
<td>F</td>
<td>0.0</td>
<td>&lt; 60.0</td>
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Policies:
6. Class discussion is encouraged.
7. If you a student find it necessary to miss a class, it is his/her responsibility to arrange for obtaining the information covered;
8. Students are required to perform individual exercises and projects.

Outline:

Week 1 (08/24 – 08/28)
An overview of remote sensing
Lab – Dealing with image data with Erdas Imagine

Week 2 (08/31 – 09/04)
Electromagnetic Radiation Principles
Lab – Examining Various Remote Sensing Data, Computing Image Statistics

Week 3 (09/07 – 09/11) (Labor Day: 09/07)
Elements of Image Interpretation and Image Data Classification
Lab – Supervised classification, Starting Project 1 (75 points)
Week 4 (09/14 – 09/18)
   Image Data Classification (continued) and Accuracy Assessment
   Lab – Unsupervised classification, accuracy assessment, Working Project 1

Week 5 (09/21 – 09/25)
   Band Transformation and Geometric Correction
   Lab – Band Transformation, Working on Project 1

Week 6 (09/28 – 10/02)
   Exam 1 (Mon) (50 points), Working on Project 1 (Wed)
   Lab – Working on Project 1 in the 1st hour and Present PPTs after.

Week 7 (10/05 – 10/09)
   Working on Project 2 (75 points) (no class meetings)
   Lab – Learning to Use MultiSpec (Instructed by Larry Biehl)

Week 8 (10/12 – 10/16) (October Break: 10/12 – 13)
   Working on Project 2 (no class meetings)
   Lab – Working on Project 2

Week 9 (10/19 – 10/23)
   Change Detection and LIDAR (Light Detection and Ranging)
   Lab – Present PPTs of Project 2, Change Detection

Week 10 (10/26 – 10/30)
   Remote Sensing Data Collection and Thermal Remote Sensing
   Lab – Land Surface Temperature Detection

Week 11 (11/02 – 11/06)
   Advanced Image Classification Methods and Remote Sensing of Vegetation
   Lab – Object-oriented classification

Week 12 (11/09 – 11/13)
   Raster GIS Methods
   Lab – GIS Applications

Week 13 (11/16 – 11/20)
   Remote Sensing of Environment and Exam 2 (50 points)
   Final Project Introduction (100 points)
   Lab – Final Project

   Final Project Continues (no class meeting)
   Lab – Work on Final Project

Week 15 (11/30 – 12/04)
   Guest Lecture (M) and Finishing Final Project
Lab – Work on Final Project

Week 16 (12/07 – 12/11)
   Class Project Presentations

Week 17
   No Final Exam