Syllabus: Topics in Earth System Remote Sensing (GEOG 285)

Instructor: Jeff Chambers

Semester: Spring 2016

Class hours: Friday 1-4

Office hours: Friday noon-1p

Course format: Lecture, computer lab, UAV lab, discussion sessions, student projects, student presentations

Total hours per week: Two hours of in-class lecture, with four hours of additional readings and project development outside of class. One hour of lab in class, and two additional lab hours outside of class to complete projects.

Course description: (3 units; 2 lecture, 1 lab) Questions asked about a changing planet are strongly influenced by data collected across a variety of spatial and temporal scales. Remote sensing of globally distributed ecosystems and human landscapes enables the exploration of questions not possible without the extension of those dimensions. This course will focus on developing scalable Earth system research questions using a variety of tools including advanced remote sensing methods, image acquisition including UAV systems, data synthesis and analytical approaches, literature review, progress reporting, and student presentations.

Goal of the course: To develop a better understanding of what questions can be approached across a range of geographical dimensions, and further develop the student's toolbox for exploring those questions and presenting results.

Timeline of topics covered:

> **Week 1, Jan 19**: Introduction to course: Earth system research questions across spatial and temporal dimensions; remote sensing tools to address those questions; course outline and requirements; discussion session planning and assignments.

> **Week 2, Jan 26:** ENVI and IDL overview; Research papers discussion-1; Open lab

> **Week 3, Feb 2:** ENVI and IDL in-depth-1; Research papers discussion-2; Open lab

> **Week 4, Feb 9:** ENVI and IDL in-depth-2; Research papers discussion-3; Open lab

> **Week 5, Feb 16:** Earth Engine overview; Research papers discussion-4; Open lab

> **Week 6, Feb 23:** Earth Engine in-depth-1; Research papers discussion-5; Open lab (First progress report due)

Week 7, Mar 2: Earth Engine in-depth-2; Research papers discussion-6; Open lab

Week 8, Mar 9: Advanced image processing and analysis tools; Research papers discussion-7; Open lab and student project development

Week 9, Mar 16: Advanced image processing and analysis tools; Open lab and student project development (Second progress report due)

Week 10, Mar 23: Open lab for project development and issue discussion

Week 11, Mar 30: Spring Break

Week 12, Apr 6: Student project presentations

Week 13, Apr 13: Student project presentations

Week 14, Apr 20: UAV Lab-1; field trip to Ceasar Chavez Park

Week 15, Apr 27: UAV Lab-2; Final discussion

(8) **Course materials**: Software provided in the CAGE lab and reading assignment from the primary literature.

(9) **Course requirements**: Participation in discussion sessions (30%), student project progress reports (35%), and student project presentations (35%).