

## **GEOG-484/584-S01 Remote Sensing**

Spring 2017

**Tuesday and Thursday 9.00am to 10.50am**

**The first two Lectures will be Tuesday 17<sup>th</sup> & Thursday 19<sup>th</sup> January 2017**

**The first Lab will be on Tuesday 24<sup>th</sup> January 2017**

Lectures: Wecota Hall, 0100 (the sunroom, ground floor)

Laboratories: Wecota Hall, 0006 (downstairs lab)

Instructor: Professor David Roy

Office: Wecota Hall 115-G

Email: david.roy@sdstate.edu

Office Hours: Wednesday afternoon by appointment

Lab Instructors: Sam Cooper & Pedro Oliveira

Emails: [sam.cooper@jacks.sdstate.edu](mailto:sam.cooper@jacks.sdstate.edu) & [Pedro.Oliveira@sdstate.edu](mailto:Pedro.Oliveira@sdstate.edu)

### **Course Description**

This course provides an overview and understanding of the technology, techniques and capabilities for remote sensing of the environment, through an investigation of the basic concepts of remote sensing and electromagnetic energy, interpretation of remotely sensed imagery, and key remote sensing applications.

### **Required Readings**

We will not use a textbook. Instead, all class materials will be available electronically on a class web site. If you are interested in an introductory remote sensing text, consider:

John R. Jenson, *Remote Sensing of the Environment: An Earth Resource Perspective*,  
Prentice-Hall Inc., 2<sup>nd</sup> edition (2007).

### **Students with Special Needs**

South Dakota State University is committed to providing equal access to University programs and services for all students. Under University policy and federal and state laws, students with documented disabilities are entitled to reasonable accommodations to ensure the student has an equal opportunity to perform in class. If any member of the class has such a disability and needs special academic accommodations, please notify me and make the appropriate arrangements with the Office of Disabilities Services. The ODS is located in room 065, the University Student Union. To schedule an appointment call (605) 688-4504 and request to speak with Nancy Hartenhoff-Crooks (or successor), the Coordinator of Disability Services, to privately discuss your specific needs. Reasonable accommodations may be arranged after the Office of Disabilities Services has verified your situation. Do not hesitate to contact me if any assistance is needed in this process.

### **Academic Freedom and Responsibility**

Under Board of Regents and University policy student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Student who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should first contact the instructor of the course to initiate a review of the evaluation. If the student remains unsatisfied, the student may contact the department head and/ or dean of the college which offers the class to initiate a review of the evaluation.

### **Cheating and Dishonesty Policy**

The University has a clear expectation for academic integrity and does not tolerate academic dishonesty. The consequences of academic cheating and dishonesty range from any and all plagiarized or compromised assignments, tests, and other forms of evaluations being given zero credit as per offense to a student being given a failing grade for the class in which the offense took place. There is also the possibility that any student who has committed a cheating offense may face disciplinary probation or expulsion from the University. University Policy 2.4 (<http://www.sdstate.edu/sites/default/files/policies/upload/Student-Academic-Integrity-and-Academic-Appeals.pdf>) sets forth the definitions of academic dishonesty. The Policy and its Procedures also set forth how charges of academic dishonesty are handled at the University. Academic Dishonesty is strictly proscribed and if found may result in student discipline up to and including dismissal from the University.

### **Absence Policy**

**Attendance in the lectures is expected — there are no make-up lectures or labs. Please be there !**

Absence due to personal reasons:

Any exceptions to the faculty member's written attendance policy due to verified medical reasons, death of a family members or significant other, or verified extenuating circumstances judged acceptable by the instructor or the Office of Academic Affairs, will be honored. If a student has an accident, falls ill, or suffers some other emergency over which he/she has no control, the student needs to gather whatever documentation is available (e.g., copies of repair or towing bills, accident reports or statements from health care provider) to show the instructor. Such exceptions must be communicated and negotiated between the student and faculty member prior to the absence whenever possible. Absences for vacations or breaks, personal interviews do not constitute a valid reason for absence.

Absence due to approved university-sponsored/recognized trips:

Faculty and administration will honor officially approved absences where individuals are absent in the interest of officially representing the University. Appropriate sanctioned activities include: Collegiate club sports and competitions; Conferences and workshops recognized by the University not related to academics; Commitments on behalf of the University (Students' Association, Band, Choir, etc.); Intercollegiate athletics (refer to page 5 of this document for Student-Athlete Class Attendance Policy); and Professional activities recognized by the University related to academics (professional conference attendance, etc.)

Requests for excused absences must be submitted one week prior to the trip or event. Students must present the completed approved trip absence card to the faculty member prior to the trip or event to have an official excused absence. Faculty members are not required to honor incomplete or late cards.

Students with official excused absences:

Students with excused absences will be given appropriate make up work or instructor-determined equivalent opportunities for obtaining grades as students who were in attendance. Students with official excused absences are not to be penalized in course progress or evaluation. However, should excused absences be excessive, the faculty member may recommend withdrawal from the course(s) or a grade of incomplete to the student.

Mediation on absence:

Arrangements should be negotiated with faculty members. If this is not possible, the students should go first to the department head, and if necessary, next to the dean. The student may contact the Office of Academic Affairs if conflict cannot be resolved at these levels.

### **Requirements and Grading**

Mid-term exam (30%)

Labs 1-6 (36%)

Final Lab Project (34%)

90-100% of total points = A

80-89% = B

70-79% = C

60-69%=D

<60% = F (fail)

There will be no “extra credit” exercises. Note, you need to get at least a “C” grade if you are a GIS Major (or you will have to repeat this class).

### **Exam Policy**

1. There will be no opportunity to take a make-up exam for unexcused absences; the student will earn a "0" for that exam.
2. For anticipated, excused absences, it is the *student's responsibility* to contact the instructor **PRIOR** to the exam, to schedule a make-up exam. This would be the case for excused extracurricular events such as academic, music, or athletic events.
3. Students may also be excused from taking the regularly-scheduled exam for unanticipated reasons such as sickness or family crisis. Students are required to document (for example, note/call from doctor/nurse/dean of students) that their absence was excusable. It is the *student's responsibility* to contact the course instructor on the day of the exam, if possible, and then on the day of the student's return so that the make-up exam can be scheduled.

4. Any make-up exams, *taken for any reason*, may be expected to be more difficult, with a higher percentage of essay type questions, and possible one-on-one discussions with the instructor.
5. After grading, exams/quizzes will be handed back in class and the correct answers discussed. Students having questions on how an exam/quiz was graded must talk to the instructor within *one week* of the day the exam/quiz was handed back in class, no adjustments to grades will be made at a later time. This time frame applies to all graded materials (e.g. lab reports).

### **Lab Procedures**

1. There will be no make-up labs.
2. Students who know they will be absent from an upcoming lab for legitimate reasons, must personally contact their lab instructor before each upcoming lab that will be missed.
3. Students who are absent for health reasons will have to provide documentation (for example, note from the nurse/doctor/dean of students). If students are absent for some other reason, the instructor will make a judgment call.
4. Students with unexcused absences will receive a "0" for the lab activity they missed if they do not submit lab. reports. Students with excused absences who are unable to attend lab will receive pro-rated scores.
5. Lab reports will be collected at the **very beginning** of the period that it is due. Any lab report submitted after the beginning of the class will be considered late and a penalty of **10 percent per day or part thereof will be deducted from the score it receives, after one week late it will not be graded.**

# GEOG-484/584 Class Schedule

- **Lecture 1:** Introduction
- **Lecture 2:** Electromagnetic radiation & Introduction to satellite data display
- **Lab. 1:** *Introduction to ENVI for display and analysis of satellite data* (assessed practical)
- **Lecture 3:** Spectral properties of materials
- **Lab. 2:** *Radiometer field trip* (assessed practical)
- **Lecture 4:** Satellite remote sensing systems and their “resolutions”
- **Lab. 3:** *The “Resolutions” of remotely sensed data* (assessed practical)
- **Lecture 5:** Geometric correction & Atmospheric correction
- **Lecture 6:** Mid Term Exam (assessed)
- **Lecture 7:** Information extraction: Spectral transformations
- **Lab. 4:** *Spectral transformations* (assessed practical)
- **Lecture 8:** Information extraction: Land surface classification
- **Lab. 5:** *Spectral Unmixing* (assessed practical)
- **Lecture 9:** Information extraction: Change detection
- **Lab. 6:** *Change detection* (assessed practical)
- **Lecture 10:** Overview of remote sensing applications
- **Lab. 7:** *Lab. student project set and student project time*
- **Lecture 11:** Space agency satellite product generation and distribution – MODIS land products
- **Labs. 8 & 9:** *Lab. student project time*
- **Lecture 12:** Summary & student project power point presentations by instructor (assessed)

## GEOG-484/584-S01 Class Schedule

# Calendar for January 2017 (United States)

January						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17 Lecture 1	18	19 Lecture 2	20	21
22	23	24 Lab 1	25	26 Lecture 3	27	28
29	30	31 Lab 2				

Phases of the Moon: 5:☉ 12:☽ 19:☉ 27:☽

Holidays and Observances: 1: New Year's Day, 2: 'New Year's Day' observed, 16: Martin Luther King Day

# Calendar for February 2017 (United States)

February						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2 Lecture 4	3	4
5	6	7 Lab 3	8	9 Lecture 5	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

Phases of the Moon: 3: ☾ 10: ☽ 18: ☾ 26: ●

Holidays and Observances: 14: Valentine's Day, 20: Presidents' Day



# Calendar for March 2017 (United States)

March						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
				Lecture 6 Mid-Term exam		
5	6	7	8	9	10	11
← Spring Break →						
12	13	14	15	16	17	18
				Lecture 7		
19	20	21	22	23	24	25
		Lab 4		Lecture 8		
26	27	28	29	30	31	
		Lab 5		Lecture 9		
Phases of the Moon: 5:☉ 12:☽ 20:☉ 27:☾						

## Calendar for April 2017 (United States)

April						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4 Lab 6	5	6 Lecture 10	7	8
9	10	11	12	13	14	15
16	17	18 Lab 7 student project set	19	20 Lecture 11	21	22
23	24	25 Lab 8 unsupervised	26	27	28	29
30						

Phases of the Moon: 3: ☉ 11: ☽ 19: ☾ 26: ●

Holidays and Observances: 13: [Thomas Jefferson's Birthday](#), 16: [Easter Sunday](#)

# Calendar for May 2017 (United States)

May						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2 Lab 9 unsupervised	3	4 Lecture 12	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Phases of the Moon: 2: ☾ 10: ☽ 18: ☾ 25: ●

Holidays and Observances: 14: Mother's Day, 29: Memorial Day