1. Course Basics

Course Name: **Introduction to Remote Sensing**

Course Prefix & Number: GEOG436/536_1, CRN 31183/34972, Fall 2026

2. Instructor Information

Jason Yang

The School of Earth, Atmosphere, and Sustainability (SEAS)
Ball State University, Muncie, IN

3. Course Information

Course Description

Lectures will review physics and various systems of remote sensing, while lab exercises will cover some applications of remote sensing in the environment. Topics include electromagnetic radiation, aerial photo interpretation, photogrammetry, multispectral-, hyperspectral-, and thermal remote sensing, RADAR/LIDAR, and remote sensing applications on vegetation, water, and urban landscapes.

Prerequisites

None

Course Goals/Objectives

- Understand the principles of aerial photography and photogrammetry
- Learn to examine spectral, spatial, and temporal properties of satellite remote sensing systems
- Explore the applications of remote sensing for environmental monitoring and natural resources management
- Develop basic skills of image processing on remotely sensed data

Course Structure

The eight-module course is divided into units that are due every two weeks; you should try to complete one module, or one chapter, on average, every two weeks. In each module, there is one homework assignment and one quiz based on the contents of the textbook,

plus one lab exercise based on the lecture in class. Each module's materials will be made available one at a time, and all of the assignments in that module need to be completed by the end of the second week.

4. Course Materials

Textbook

- ***Required:*** Chipman, T.L.R.W.K. 2015, *Remote Sensing and Image Interpretation, 7th Edition*, Wiley Global Education US.
- Details see Modules|Instructor, Textbook & Software|Textbook

Software

This course requires the digital image processing software ***ERDAS Imagine,*** which has been installed on all computers in the GIS labs in the School of Earth, Atmosphere, and Sustainability (SEAS) and some computers in the Bracken Library. You need to use this software to complete most lab exercises and projects for image processing. Library Software Locator can be used to find those computers in Ball State libraries that have the software installed and available to use by typing "ERDAS" to search.

If you are not able to be on campus to use those computers or have to learn from home in some circumstances, you need to request to install the software on your own computer. Details of installing this software can be found in the Modules|Instructor, Textbook & Software|Software.

5. Course Assignments and Assessments

Course Assignments

Your performance on this course will be evaluated by homework, lab exercises, quizzes, and attendance. Students' final grade (letter) for this course will be determined by the weighted percentage calculated using the following weights. Homework and lab exercises are graded based on correctness and quality. Only those assignments turned in by the stated due date are eligible for full credit consideration, although late submission is also accepted for a decreased grade for each day late. The quizzes of each chapter are based on the contents in that chapter; you need to read through the textbook in that chapter before you take the quiz. Each quiz has two attempts, and they are open-book assessments.

GEOG 436 Undergraduates		GEOG536 Graduates	
Attendance	5%	Attendance	5%
Homework	25%	Homework	22%
Quizzes:	35%	Quizzes:	32%
Labs:	35%	Labs:	32%
		Book review	9%
Total	100%	Total	100%

Graduate students who enrolled in GEOG536 are required to complete an extra term project, which is a book review for another book on remote sensing applications in the fields of your interest. Please check the library at your earliest convenience and show me the book before you begin reading it.

Assignment details, including instructions, relevant readings, due dates, and grading criteria/rubrics will be posted and updated on Canvas. Please check Canvas regularly to stay informed and on track.

Course Grading Scale

All students' grades are determined by the weighted grade percent (the Total column) in the Grade Center and lettered in the following grade scales:

		B+	87.0-89.9%	**C+**	77.0-79.9%	**D+**	67.0-69.9%	**F**	< 59.9%
A	>= 94.0%	**B**	84.0-86.9%	**C**	74.0-76.9%	**D**	64.0-66.9%		
A-	90.0-93.9%	**B-**	80.0-83.9%	**C-**	70.0-73.9%	**D-**	60.0-63.9%		

6. University Policies and Statements

University Statement

We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse. If you need course adaptations or accommodations because of a disability, please contact the instructor of

record as soon as possible. Ball State's Disability Services Office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or dsd@bsu.edu.

Freedom of Expression

In this course, we are committed to fostering a learning environment that values intellectual diversity, encourages free expression, and promotes open inquiry. As members of the Ball State Community, we treat each person in the Ball State community with civility, courtesy, compassion, and dignity and respect and learn from differences in people, ideas, and opinions. Please review Ball State University's Statement on Freedom of Expression, the resources on Ball State's Freedom of Expression webpage, and Ball State's Beneficence Pledge.

Attendance

Attendance makes up 5% of your final grade in this course; if you attend less than 70% of the time without a verifiable excuse and documentation, you won't receive any credit on attendance.

Title IX

Ball State University is committed to providing a safe and inclusive learning environment for all students. If you or someone you know has experienced sexual harassment—including sexual assault, dating violence, domestic violence, or stalking, please know that you are not alone. The University offers support services and resources. For more information or to report an incident, please visit bsu.edu/titleix or contact the Title IX Coordinator at 765-285-1545 or at titleix@bsu.edu

As your instructor, I am a mandatory reporter under the Title IX policy and required to report any information I receive about possible sexual harassment. This includes information shared in class discussions, assignments, or private conversations.

What happens after I report? The Title IX Coordinator will email the person who experienced sexual harassment (complainant) and invite them to schedule a meeting. If the complainant **chooses** to meet with the Title IX Coordinator,

- Title IX Coordinator will offer supportive measures (e.g., counseling, extensions on deadlines, course-related adjustments, changes to work or class schedules, and/or referrals to campus offices), review the policy, and discuss options to move forward.

- If a complaint is filed by the complainant or the University, an investigation will begin following University policy.

University Grade Appeal Policy

If you believe you received a final course grade that does not reflect your performance due to fairness or a procedural issue, you have the right to file an appeal within 5 school days after final grades are posted by the Office of the Registrar. Review the University Grade Appeal Policy and Process.]

Student Academic Ethics Policy

Honesty, trust, and personal responsibility are fundamental attributes of the university community. Academic dishonesty and other forms of academic misconduct threaten the foundation of an institution dedicated to the pursuit of knowledge and will not be tolerated. To maintain its credibility and reputation, and to equitably assign evaluations of scholastic and creative performance, Ball State University is committed to maintaining a climate that upholds and values the highest standards of academic integrity. Visit the VPAA's academic integrity website (Students tab) for resources on understanding academic integrity, citing sources properly, and avoiding inadvertent academic dishonesty. To learn about BSU's academic integrity expectations and students' rights, please read the University Student Academic Ethics Policy.

Academic integrity violations include giving or receiving an unfair academic advantage (cheating), presenting someone else's ideas or work as your own (plagiarism), and falsifying academic records. Unless otherwise indicated, you must work independently by yourself. Check with me if you are unsure whether something constitutes academic dishonesty. Examples of academic integrity violations include but are not limited to:

- Using resources not authorized by the faculty member (including devices, AI tools, hidden notes, and open books)
- Using commercial study websites to find answers to graded assignments (Chegg, Course Hero, StudyPool, OneClass, etc.).
- Without the instructor's written permission, giving away, buying, or selling graded assignments class notes, exams, study guides, or other course materials to other students or to third-party vendors (Course Hero, Chegg, 24HourAnswers, etc.).
- Working with another person on any assignment other than authorized group projects.

- Sharing or allowing others to access your files, whether done with permission or not.
- Reusing your own work from another semester, course, or section.
- Sharing answers with others during exams (passing notes, texting, whispering, gesturing)
- Discussing exam questions and answers with students who have not taken the exam.
- Soliciting others to complete work for you.

Generative AI Statement

Some Use of Generative AI Permitted Under Some Circumstances or With Explicit Permission

ChatGPT and other generative AI tools may be used in this class to support your ideas, but not for assignment completion. You will be informed as to when, where, and how these tools are permitted to be used, along with guidance for attribution. Any use outside of this permission constitutes a violation of Ball State University's Student Academic Ethics Policy.

7. Student Support Services

The Learning Center

The Learning Center offers free Tutoring and Academic Coaching for many courses at Ball State. Students can make appointments for online (Zoom) or in-person (NQ 350) appointments. To make an appointment, visit myballstate.bsu.edu and click on "Navigate" in the Academic Tools section, or just go directly to bsu.navigate.eab.com.

Testing accommodations for students with disabilities are available for students who have received the appropriate documentation from Disability Services. Tests may be administered in the Learning Center.

Supplemental Instruction is available in select courses. If you have an SI leader for your course, that person will provide students with information the first week of school regarding weekly study sessions. For more information about Learning Center programming, visit bsu.edu/learningcenter or call 765-285-1006. Follow us on Instagram: BallStateLC.

The Counseling Center

The Ball State University Counseling Center offers free and confidential services to all students. The Counseling Center is located in Lucina Hall, Room 320. To schedule an appointment, you can contact us at 765-285-1736. Ball State also offers a 24/7 Crisis Line, which can be reached at 765-285-HOPE (4673). The Crisis Line is a mental health resource for those who are struggling with any mental health concerns, including thoughts of self-harm and/or suicide.

At the Ball State Counseling Center, we see students for a variety of reasons, some of which include homesickness, relationship concerns, anxiety, and depression. At your first appointment, you will work with a therapist to create a plan that will connect you with resources that best fit your needs. We assist students with getting connected to therapy at our Center as well as connecting students to self-help resources, other on-campus resources, and community-based resources. All Ball State students also have access to several on-demand, self-help resources through a variety of different platforms. All of these resources, including a direct link to our website, can be found **here**.

The Speaking Center

The Speaking Center is a free resource available to all members of the BSU community wanting to improve their public speaking abilities. We offer personalized coaching designed to help you become a more confident and effective speaker. Our trained coaches provide constructive feedback and support throughout the entire speech preparation process, whether you are in the early stages of brainstorming ideas and organizing your thoughts, or you need to practice your delivery and refine your message.

The Center is in the David Letterman Communication and Media Building, room 302. To schedule an appointment, please access us through your Navigate app or use this direct link to sign up for a time**.** Appointments are available both in person and on Zoom. Appointments are available in person, on Zoom, and in virtual reality (VR) for those interested in practicing in an immersive speaking environment.

The Basic Needs Hub

If you are having difficulty affording enough food, do not have a safe and reliable place to sleep, and/or experiencing an emergency or crisis, help is available through the Basic Needs Hub. The Basic Needs Hub has information, resources, and provides individualized support to students. To talk with a supportive staff member about your experience, receive one on one assistance, or learn more about resources, you can submit a Basic Needs Assistance Form.

8. Canvas and Student Privacy

Canvas Accessibility

Canvas provides a user experience that is easy, simple, and intuitive. Special attention has been paid to making Canvas screen-readable. The Rich Content Editor encourages users to create accessible content pages (i.e. text formatting is accomplished using styles). Canvas is designed to allow limited customization of colors and schemes to be accessible for all users. The National Federation of the Blind granted Canvas the Gold Level Web Certification in 2010.

Find more information by visiting the Canvas Voluntary Product Accessibility Template (VPAT).

FERPA and Privacy

As a student, your educational records are considered confidential. Under FERPA (Family Educational Rights and Privacy Act), your records are confidential and protected. Under most circumstances, your records will not be released without your written and signed consent. However, some directory information may be released to third parties without your prior consent unless a written request to restrict this is on file. You can learn more about student rights to privacy by reading **Ball State's FERPA and Privacy and Protection.**

9. Course Expectations and Policies

Course Participation Expectations

- This course is designed with bi-weekly activities and other forms of regular collaboration and communication.
- It is recommended that you log into your Canvas course 3 to 4 times a week and check your official Ball State email account daily to view announcements and prepare for class.
- Complete all assignments, quizzes, and any other activities by the stated due dates.

Feedback Policy

- I or TA will respond to email from your official Ball State email address within 24 hours during weekdays (Monday-Friday) and within 48 hours on the weekend.
- I or TA will read every discussion post but I will not always personally comment on posts.

- I or TA will grade your quizzes, assignments, and discussions no later than within 5 school days of submission.
- Contact me directly if you have questions or concerns about your performance in class.

Late Assignment Policy

- All assignments are due by 11:59 pm EST/EDT time on the due dates indicated.
- Assignments posted after the indicated due dates will be subject to a decreased letter grade for each day late.
- Internet connectivity and technical issues may occur and impede you from turning in work on time. Turn in work early and often, and set up a back-up plan, such as visiting a local library or borrowing a peer's computer.
- You have one (1) permitted late assignment to allow for these issues, to which you can turn in one assignment 24 hours late.
- Canvas will not accept assignments for grading after 11:59 pm EST/EDT on the final day of class.

Assignment Submission Policy

- All assignments should be submitted as Word documents with extensions of .doc or .docx unless otherwise indicated in the assignment description.
- Assignments, unless otherwise indicated, should be submitted using the assignment link in the module**.**

Grading Policy

- It is my policy that appropriate evaluation of your academic performance is an integral part of your learning experience.
- In the absence of mistakes, fraud, bad faith or incompetence, I will be the key decision-maker on the assignment of grades.

Engagement Expectations

To support a respectful and engaging academic community that encourages the free exchange of ideas and civil discourse, we will follow these ground rules:

- **Respect different perspectives.** Share your ideas and let others share theirs.

- **Challenge ideas, not people.** Disagree respectfully. No personal attacks or put-downs. Focus on exploring ideas critically and constructively.
- **Listen to understand.** Stay curious, ask questions to understand, and give others space to speak.
- **Assume good intentions.** Approach discussions with curiosity and compassion.
- **Keep it private.** What is shared in class stays in class. Do not share others' words or work without permission.
- **Be respectful.** Avoid hurtful language, stereotypes, or content that may demean others. Keep feedback constructive.

10. Course Schedule

WEEK	CHAPTER	ASSIGNMENTS	POINTS
2-3	1 CONCEPTS AND FOUNDATIONS OF REMOTE SENSING	HW\Quiz\Lab	100\100\100
4-5	2 ELEMENTS OF PHOTOGRAPHIC SYSTEMS	HW\Quiz\Lab	100\100\100
6-7	3 BASIC PRINCIPLES OF PHOTOGRAMMETRY	HW\Quiz\Lab	100\100\100
8-9	4 MULTISPECTRAL, THERMAL, AND HYPERSPECTRAL SENSING	HW\Quiz\Lab	100\100\100
10-11	5 EARTH RESOURCE SATELLITES OPERATING IN THE OPTICAL SPECTRUM	HW\Quiz\Lab	100\100\100
12-13	6 MICROWAVE AND LIDAR SENSING	HW\Quiz\Lab	100\100\100
	7 DIGITAL IMAGE ANALYSIS (Optional)	Quiz	100
14-15	8 APPLICATIONS OF REMOTE SENSING	HW\Quiz\Lab	100\100\100

	Oral presentation for the final project is set at the course's final exam time, December 11, 2026 from 9:45 to 11:45 a.m. in this lab.		

11. Subject to Change Statement

This syllabus is subject to change in the event of extenuating circumstances.