# Course Syllabus: AGHR 4413-Z02-Geospatial Technology

<table>
<thead>
<tr>
<th>Department of Agriculture, Nutrition &amp; Human Ecology</th>
<th>College of Agriculture and Human Sciences</th>
</tr>
</thead>
</table>

**Instructor Name:** Ram Ray, Ph.D., P.E.  
**Office Location:** College of Agriculture and Human Sciences  
**Office Phone:** 936-261-5094  
**Fax:** 936-261-2548  
**Email Address:** raray@pvamu.edu  
**Snail Mail (U.S. Postal Service) Address:** Prairie View A&M University  
| P.O. Box | 519  
| Mail Stop | 2008  
| Prairie View, TX 77446 |

**Office Hours:** CARC RM # 120, TBD  
**Virtual Office Hours:** Open Door Policy as needed  
**Course Location:** AG/BUS # 210 and Online-ZOOM  
**Online class Meeting Days & Times:** TR: 11:30 AM to 13:00 PM  
**Course Abbreviation and Number:** AGHR 4413-Z02  

**Catalog Description:** This course introduces students to Global Positioning System (GPS), Remote and ground sensors and geospatial technology using Geographical Information System (GIS) tools that help in capturing, storing, processing and displaying information linked to a particular location and their application to plant and soil sciences, precision agriculture, and natural resources and environmental systems.

**Prerequisites:** Students must have a grade of "C" or higher in MATH 1113 or equivalent.  
**Co-requisites:** None

**Required Text:**  
2. GIS Tutorial 1: Basic Workbook for ArcGIS 10.3.1 Book by Wilpen L. Gorr and Kristen S. Kurland  
Supplemental Readings will be provided by the instructor

**Recommended Texts:**  

**Access to Learning Resources:**  
PVAMU Library:  
Phone: (936) 261-1500;  
web: [http://www.pvamu.edu/library/](http://www.pvamu.edu/library/)  
University Bookstore:  
Phone: (936) 261-1990;  
web: [https://www.bkstr.com/Home/10001-10734-1?demoKey=d](https://www.bkstr.com/Home/10001-10734-1?demoKey=d)

**Course Goals or Overview:**  
This course is designed to introduce students to the basic applications of global positioning systems (GPS) geographic information system (GIS) and fundamentals of geospatial technologies that agricultural (plant and soil sciences) professionals and other geospatial analysts use to access, analyze, and display geographic information for precision agriculture and natural resources and environmental systems (e.g., Soil, Water, Plant). It is an integrated approach to understanding the applications of GPS, GIS, and remote and ground sensing to address some of the critical issues in natural resources and environmental systems (soil, water, and plant), and agriculture (precision agriculture) through hands-on computer-based exercises.

**Course Objectives:**
1. Learn about the global positioning systems (GPS), remote sensing (RS), ground sensing (GS), and digital mapping and imaging
2. Demonstrate proficiency in the fundamental scientific concepts and application of GPS, GIS, RS and GS.
3. Provide knowledge about sensor systems, digital mapping, field mapping, GPS systems, and components.
4. Enhance student’s understanding of the characteristics of spatial and feature data.
5. Learn how these various technologies can be incorporated into producing maps, especially using multi-layers of data, and apply these technologies to the plant and soil sciences, natural resources, and agriculture.

At the end of this course, the student will
1. Acquire fundamental knowledge in the GPS, GIS, RS and GS disciplines
2. Identify and critically analyze the issues involved in organizing, planning, monitoring, and controlling geospatial data and related projects.
3. Review the current geospatial technologies and appraise their effectiveness and applications.
4. Critically evaluate and analyze spatial and feature data.
5. Interpret the GPS signal and the factors that affect signal quality.
6. Develop knowledge and skills to work professionally with others in a team.

Course Evaluation Methods

This course will use the following five instruments to determine student's grades based on their proficiency and the learning outcomes for the course. Exams. Exercises, Projects, Labs, and class participation.

Detailed Description of Major Assignments:
The instruments listed below will be used to determine student's grades & proficiency of the learning outcomes for the course

<table>
<thead>
<tr>
<th>Assignment Title or Grade Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>Written tests designed to measure knowledge gained from the course</td>
</tr>
<tr>
<td>Exercises</td>
<td>Written assignments designed to supplement and reinforce the course material</td>
</tr>
<tr>
<td>Projects</td>
<td>Assignments designed to measure student's ability to apply the knowledge gained in the class</td>
</tr>
<tr>
<td>Labs</td>
<td>Exercises designed to reinforced lectures and provide practical experience</td>
</tr>
<tr>
<td>Class Participation</td>
<td>Daily attendance and participation in class discussions</td>
</tr>
</tbody>
</table>

Grading Matrix

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Value (points or percentages)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance, participation, &amp; discussion</td>
<td>10%</td>
<td>10</td>
</tr>
<tr>
<td>Quiz</td>
<td>10%</td>
<td>10</td>
</tr>
<tr>
<td>Lab work</td>
<td>30%</td>
<td>30</td>
</tr>
<tr>
<td>Midterm exam/Project</td>
<td>15%</td>
<td>15</td>
</tr>
<tr>
<td>Project Presentation</td>
<td>10%</td>
<td>10</td>
</tr>
<tr>
<td>Final Exam/Project</td>
<td>25%</td>
<td>25</td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Grading Criteria and Conversions:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100</td>
</tr>
<tr>
<td>B</td>
<td>80-89</td>
</tr>
<tr>
<td>C</td>
<td>70-79</td>
</tr>
<tr>
<td>D</td>
<td>60-69</td>
</tr>
<tr>
<td>F</td>
<td>0-59</td>
</tr>
</tbody>
</table>

Attendance Policy
Rules for dropping and adding classes are the same as those for the university. Students are expected to attend all online classes.

Exam Policy
Exams should be taken as scheduled in the syllabus or as per instructor's schedule. No makeup examinations will be allowed except under documented emergencies (See Student Handbook).
Submission of Assignments:
Observe deadlines for submitting assignments to avoid a 5% penalty for each. Late assignments will result in a 5% deduction for each day submitted after the assignment due date. However, assignments may not be accepted if they are more than seven calendar days late.

Tentative Weekly Class Schedule:
This is subject to change. Any changes to the schedule will be announced during the lecture by the instructor or will be posted on the course web site.

Tentative Weekly Schedule:
This is subject to change. Any changes to the schedule will be announced in lecture and on the course web site.

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Labs</th>
<th>Chapters</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction: GPS, GIS, Remote sensing, and Ground sensing</td>
<td>Warm-up lab</td>
<td>Chapters 1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Geospatial Data and GPS</td>
<td>Introduction to geospatial concept</td>
<td>Chapters 1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Digital world, datum, co-ordinate system, map projections</td>
<td>Co-ordinate and position measurements</td>
<td>Chapter 2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Spatial Data and GIS</td>
<td>Introduction to GIS</td>
<td>Chapter 5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Using GIS for spatial analysis</td>
<td>Spatial/surface analysis</td>
<td>Chapter 6</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>GPS</td>
<td>GPS application/field</td>
<td>Chapter 4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>GIS mapping</td>
<td>GIS layouts</td>
<td>Chapter 7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Geocoding, network analysis /Google Earth</td>
<td>Geocoding and shortest path analysis</td>
<td>Chapter 8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Mid-term exam</td>
<td>Field work (TBD)</td>
<td>Mid-term exam</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Land cover/Land use Analysis</td>
<td>Use crop layer data to identify major cropland across the state</td>
<td>Handout/TBD</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Soil mapping and analysis</td>
<td>Use soil data to identify major cropland across the state</td>
<td>Handout/TBD</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Soil and plant data collection and mapping: No lecture, field day to collect soil and plant data</td>
<td>Develop map using collected field data</td>
<td>Handout/TBD</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Digital Landscaping/ Agricultural watershed</td>
<td>Digital Terrain Analysis using digital elevation model (DEM). Identify the agriculturally dominated watersheds across the state</td>
<td>Chapter 13</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>GIS tools and online resources</td>
<td>Exploring ArcGIS online, QGIS</td>
<td>Handout/TBD</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Exam</td>
<td>Presentation/No lab</td>
<td>Final Exam</td>
<td></td>
</tr>
</tbody>
</table>
Student Support and Success

John B. Coleman Library

The library and its partners have as their mission to provide resources and instructional material in support of the evolving curriculum, as a partner in Prairie View A&M University's mission of teaching, research, and service and to support the University's core values of access and quality, diversity, leadership, relevance, and social responsibility through emphasis on ten key areas of service. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty. 

https://www.pvamu.edu/library/ Phone: 936-261-1500

The Learning Curve (Center for Academic Support)

The Learning Curve offers Tutoring via peer tutoring. The services include workshops (i.e., Save My Semester, Recalculate Your Route), seminars (i.e., Tools You Can Use: TI-84), group review sessions (i.e., College Algebra Topic Reviews, GRE Preparation), group study opportunities (i.e., TSIA, HESI, Study Break, Exam Cram), and test-taking strategies (How to take Notes, Study Buddy, 5 Day Study Guide). The Learning Curve is a nationally certified tutoring program through the National Tutoring Association. The peer tutors are trained and certified by the coordinator each semester. Location: J.B. Coleman Library Rm. 207F. Phone: 936-261-1561

The Center for the Oversight and Management of Personalized Academic Student Success (COMPASS)

The Center for the Oversight and Management of Personalized Academic Student Success (COMPASS) is designed to help Prairie View students in their second year and beyond navigate towards graduation by providing the following services: Academic Advisement, Targeted Tutorials for Personalized Learning, Campus-Wide Referrals, and Academic & Social Workshops. Location: J.B. Coleman Library Rm. 306. Phone: 936-261-1040

Writing Center

The Writing Center provides student consultants on all aspects of the writing process and a variety of writing assignments. Writing Center consultations assist students in such areas as prewriting, brainstorming, audience awareness, organization, research, and citation. Students taking online courses or courses at the Northwest Houston Center or College of Nursing may consult remotely or by e-mail. Location: Hilliard Hall Rm. 121. Phone: 936-261-3724.

Student Counseling Services

The Student Counseling Services unit offers a range of services and programs to assist students in maximizing their potential for success: short-term individual, couples, and group counseling, as well as crisis intervention, outreach, consultation, and referral services. The staff is licensed by the State of Texas and provides assistance to students who are dealing with academic skills concerns, situational crises, adjustment problems, and emotional difficulties. Information shared with the staff is treated confidentially and in accordance with Texas State Law. Location: Owens-Franklin Health Center Rm. 226. Phone: 936-261-3564

Testing

The Department of Testing administers College Board CLEP examinations, the HESI A2 for pre-nursing majors, LSAT for law school applicants and MPRE for second-year law students, the Experiential Learning Portfolio option, the Texas Success Initiative (TSI) Assessment, which determines college readiness in the state, and exam proctoring, among other service such as SAT and ACT for high school students. Location: Delco Rm. 141. Phone: 936-261-4286

Office of Diagnostic Testing and Disability Services

As a federally-mandated educational support unit, the Office of Disability Services serves as the repository for confidential disability files for faculty, staff, and students. For persons with a disability, the Office develops individualized ADA letters of request for accommodations. Other services include: learning style inventories, awareness workshops, accessibility pathways, webinars, computer laboratory with adapted hard and software, adapted furniture, proctoring of non-standardized test administrations, ASL interpreters, ALDs, digital
recorders, Livescribe, Kurtzweil, and a comprehensive referral network across campus and the broader community. Location: Evans Hall Rm. 317. Phone: 936-261-3585

Veteran Affairs
Veterans Services works with student veterans, current military and military dependents to support their transition to the college environment and continued persistence to graduation. The Office coordinates and certifies benefits for both the G.I. Bill and the Texas Hazlewood Act. Location: Evans Hall Rm. 323. Phone: 936-261-3563

Office for Student Engagement
The Office for Student Engagement delivers comprehensive programs and services designed to meet the co-curricular needs of students. The Office implements inclusive and accessible programs and services that enhance student development through exposure to and participation in diverse and relevant social, cultural, intellectual, recreational, community service, leadership development and campus governance. Location: Memorial Student Center Rm. 221. Phone: 936-261-1340

Career Services
Career Services supports students through professional development, career readiness, and placement and employment assistance. The Office provides one-on-one career coaching, interview preparation, resume and letter writing, and career exploration workshops and seminars. Services are provided for students at the Northwest Houston Center and College of Nursing in the Medical Center twice a month or on a requested basis. Distance Learning students are encouraged to visit the Career Services website for information regarding services provided. Location: Evans Hall Rm. 217. Phone: 936-261-3570

University Rules and Procedures

Disability Statement (Also See Student Handbook):
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Evans Hall, Room 317, or call 936-261-3585/3.

Academic Misconduct (See Student Handbook):
You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of Academic Dishonesty:
1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.
3. Fabrication: use of invented information or falsified research.
4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else’s words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

Nonacademic Misconduct (See Student Handbook)
The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or

(3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean
of Students under nonacademic procedures.

**Sexual Misconduct (See Student Handbook):**
Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

**Title IX Statement**
Prairie View A&M University (PVAMU) is committed to supporting students and complying with the Texas A&M University System non-discrimination policy. It seeks to establish an environment that is free of bias, discrimination, and harassment. If you experience an incident of sex- or gender-based discrimination, including sexual harassment, sexual assault or attempted sexual assault, we encourage you to report it. While you may talk to a faculty member about an incident of misconduct, the faculty member must report the basic facts of your experience to Ms. Alexia Taylor, PVAMU’s Title IX Coordinator. If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are individuals who can meet with you. The Title IX Coordinator is designated to handle inquiries regarding non-discrimination policies and can assist you with understanding your options and connect you with on- and off-campus resources. The Title IX Coordinator can be reached by phone at 936-261-2123 or in Suite 013 in the A.I. Thomas Administration Building.

**Class Attendance Policy (See Catalog for Full Attendance Policy)**
Prairie View A&M University requires regular class attendance. Attending all classes supports full academic development of each learner whether classes are taught with the instructor physically present or via distance learning technologies such as interactive video and/or internet.

Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class during regular semesters and summer terms. Each faculty member will include the University's attendance policy in each course syllabus.

**Student Academic Appeals Process**
Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

**TECHNICAL CONSIDERATIONS**

**Minimum Recommended Hardware and Software:**
- Intel PC or Laptop with Windows 7 or higher
- High-speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15" monitor, 800x600, color or 16 bit Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse
- Most current version of Google Chrome, Safari, Internet Explorer or Firefox
- Google Earth Pro

**Note:** Be sure to enable Java & pop-ups in the Web browser preferences

**Participants should have a basic proficiency of the following computer skills:**
- Sending and receiving email
- Working knowledge of the Internet
- Proficiency in Microsoft Word (or a program convertible to Word)
- Proficiency in the Acrobat PDF Reader
- Basic knowledge of Windows or Mac O.S.
- Basic knowledge to install software

**Netiquette (online etiquette):**
Students are expected to participate in all discussions and virtual classroom chats (if organized) as directed. Students are to be respectful and courteous to others on discussions boards. Foul or abusive language will not be tolerated.

When using Zoom, and you are on VIDEO, make sure the visible area is clear of inappropriate or offensive posters and other distractions. Stay muted when you are not speaking and avoid eating/drinking during the session. Before the class session begins, test audio, video, and lighting to alleviate technology issues.

**Technical Support:**

Students should go to [https://mypassword.pvamu.edu/](https://mypassword.pvamu.edu/) if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Office of Distance Learning at 936-261-3283.

**Center for Instructional Innovation and Technology Services (CIITS)**

Distance Learning also referred to as Distance Education, is the employment of alternative instructional delivery methods to extend programs and services to persons unable to attend college in the traditional manner. The Center for Instructional Innovation and Technology Services (CIITS) supports student learning through online, hybrid, web-assisted, and 2-way video course delivery. For more details and contact information, visit: [CIITS Student Webpage](https://www.pvamu.edu/its/student-services-2/); Phone: 936-261-3283.

Information Technology Services offers a wide array of technology resources to its students. Our web-based applications allow students to access e-mail; manage their academic and financial transactions in a secure and easy-to-use environment. The wireless network on all campus continues to expand, allowing faculty and students to collaborate almost anywhere. Please use the links to this page to get more information about the computing and technology resources that are available.

[https://www.pvamu.edu/its/student-services-2/](https://www.pvamu.edu/its/student-services-2/)

**For the PVAMU Virtual Desktop**

[https://www.pvamu.edu/its/vdi/](https://www.pvamu.edu/its/vdi/)

**Canvas**

Click on this link [https://community.canvaslms.com/t5/help/faqpage](https://community.canvaslms.com/t5/help/faqpage) for a FAQ of "frequently asked questions," as well as tutorials and instructions on how to use the tools and features in Canvas.

**Communication Expectations and Standards:**

E-mails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent e-mails should be marked as such. Check regularly for responses. The instructor will **ONLY** send e-mail to PVAMU issued e-mail addresses.

I will be available via e-mail, phone, Zoom whenever you need help with doing laboratory exercises and projects. I will be available during the weekdays, holidays, weekends, and during my office hours or by appointments. I will prefer, though, if you let me know in advance if you need help on Zoom so that I can make myself available at the agreed time. I will respond to each e-mail within a couple of hours. I usually post grades and feedback within one week of a due date.

**Discussion Requirement:**

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can take place in a seminar fashion. This will be accomplished by the use of the discussion board. The exact use of discussion will be determined by the instructor.

**It is strongly suggested** that students type their discussion postings in a word processing application and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, it/they should be copied and pasted to the discussion board.