

Academic Year 2025-2026

MS in Geospatial Sciences - MS-MSGs Learning Outcomes

GIS and Spatial Data Management **MET**

Students will acquire, manage, visualize, and process geospatial datasets using appropriate GIS technologies.

MEASURES	RESULTS	ACTIONS
GIS Data Download Direct - Exam (Course-based) <i>Advanced GIS Analysis and Appl: GEOL 5312</i>	MET Overall Proficiency ■ Met  0% 100% <i>Values are not shown when too close to each other. Click or use arrow keys to see details.</i> Met: 100% Met Total: 100% Not Met Total:	<i>No actions have been added.</i>
GPS data collection Direct - Assignment <i>Advanced GPS Mtds and Apps: GEOL 5303</i>	<i>No results have been added.</i>	<i>No actions have been added.</i>
Geo-visualization Direct - Assignment <i>Principles of GIS: GEOL 5311</i>	MET Overall Proficiency ■ Met  0% 100% <i>Values are not shown when too close to each other. Click or use arrow keys to see details.</i> Met: 100% Met Total: 100% Not Met Total:	<i>No actions have been added.</i>
GIS Data Management <i>Advanced GIS Analysis and Appl: GEOL 5312</i>	MET Overall Proficiency ■ Met  0% 100% <i>Values are not shown when too close to each other. Click or use arrow keys to see details.</i>	<i>No actions have been added.</i>

	Met: 100% Met Total: 100% Not Met Total:	
Drone operation and mission planning <i>Special Topic Env Geo: GEOL 5301</i>	MET Overall Proficiency ■ Met  0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	<i>No actions have been added.</i>
Geoprocessing Direct - Assignment <i>Principles of GIS: GEOL 5311</i>	MET Overall Proficiency ■ Met  0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	<i>No actions have been added.</i>

Remote Sensing Applications **NOT MET**

Students will understand the principles and processes of remote sensing and analyze and interpret remotely sensed data for environmental, urban, or resource management applications.

MEASURES	RESULTS	ACTIONS
Remote Sensing Basics <i>Principles of Remote Sensing: GEOL 5314</i>	MET Overall Proficiency ■ Met  0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details.	<i>No actions have been added.</i>

	Met: 100% Met Total: 100% Not Met Total:	
AI for remote sensing <i>Remote Sensing Data & Apps: GEOL 5316</i> Target 80% of the students will achieve a score of 90 or above.	MET Overall Proficiency ■ Met  0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	No actions have been added.
Image processing product accuracy assessment <i>Remote Sensing Data & Apps: GEOL 5316</i> Target 80% of the students will achieve a score of 90 or above.	MET Overall Proficiency ■ Met  0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	No actions have been added.
Satellite data acquisition and management <i>Remote Sensing Data & Apps: GEOL 5316</i> Target 80% of the students will achieve a score of 80% or above.	MET Overall Proficiency ■ Met  0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	No actions have been added.
Drone photogrammetry image processing	NOT MET Overall Proficiency	No actions have been added.

Target 80% of the students will achieve a score of 90 or above.	Met Not Met 0% 100% Met: 60% Not Met: 40% Met Total: 60% Not Met Total: 40%	
Remote Sensor Image Preprocessing Direct - Assignment Remote Sensing Data & Apps: GEOL 5316 Target 80% of the students will achieve a score of 90 or above	NOT MET Overall Proficiency Met Not Met 0% 100% Met: 33% Not Met: 67% Met Total: 33% Not Met Total: 67%	No actions have been added.

Conclusion

The goal is to achieve over 5 out of 6 measures.

Advanced Geospatial Analysis Met

Students will apply advanced geospatial analysis techniques to solve complex spatial problems.

MEASURES	RESULTS	ACTIONS
Advanced GIS Final Project Direct - Presentation Advanced GIS Analysis and Appl: GEOL 5312	MET Overall Proficiency Met 0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	No actions have been added.
3D GIS Modeling	MET Overall Proficiency	No actions have been added.

Building 3-dimensional digital twins to represent the real world using geospatial data. Direct - Assignment Advanced GIS Analysis and Appl: GEOL 5312 Target 80% of the students will achieve a score of 90 or above	Met 0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	
Advanced Geospatial Analysis Direct - Assignment Advanced GIS Analysis and Appl: GEOL 5312 Target 80% of the students will score 90 or above.	MET Overall Proficiency Met 0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	No actions have been added.

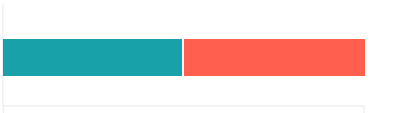
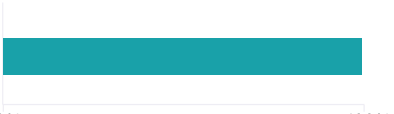
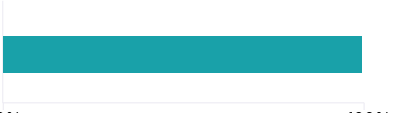
General Outcome Actions

ACTIONS
Revise Measurement / Assessment Not Started Add more specific outcomes to this part.

Research and Critical Thinking MET

Students will design and conduct independent geospatial research using appropriate scientific methods.

MEASURES	RESULTS	ACTIONS
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Proposal Writing: Geospatial Seminar Direct - Other <i>Seminar in Geospatial Science: GEOL 5317</i> Target At least 80% of students will achieve a score of 80% or higher on the final term paper, which is structured as a research proposal.	NOT MET Overall Proficiency Met Not Met  0% 100% Met: 50% Not Met: 50% Met Total: 50% Not Met Total: 50%	No actions have been added.
Independent GIS Project Direct - Exam (Course-based) <i>Advanced GIS Analysis and Appl: GEOL 5312</i> Target 80% of the students will achieve a score of 90 or above.	MET Overall Proficiency Met  0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	No actions have been added.
Independent Remote Sensing Project Direct - Exam (Course-based) <i>Remote Sensing Data & Apps: GEOL 5316</i> Target 80% of the students will achieve a score of 90 or above.	MET Overall Proficiency Met  0% 100% Values are not shown when too close to each other. Click or use arrow keys to see details. Met: 100% Met Total: 100% Not Met Total:	No actions have been added.

Professional Communication **MET**

Students will effectively communicate geospatial methods, results, and recommendations through written reports, digital and online mapping, and oral presentations.

MEASURES	RESULTS	ACTIONS
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Proposal presentation - Geospatial Seminar Direct - Presentation <i>Seminar in Geospatial Science: GEOL 5317</i> Target At least 80% of students will achieve a score of 80% or higher on the presentation they made on a research topic they are interested in.	MET Overall Proficiency ■ Met 0% 100% <i>Values are not shown when too close to each other. Click or use arrow keys to see details.</i> Met: 100% Met Total: 100% Not Met Total:	<i>No actions have been added.</i>
Literature Review Presentation Direct - Presentation <i>Advanced GIS Analysis and Appl: GEOL 5312</i> Target 80% of the students will achieve a score of 90 or above.	MET Overall Proficiency ■ Met ■ Not Met 0% 100% Met: 86% Not Met: 14% Met Total: 86% Not Met Total: 14%	<i>No actions have been added.</i>

MS in Geospatial Sciences - MS-MSGS Success Outcomes

Degree Completion

Students will successfully complete the MS in Geospatial Sciences program within the expected time frame. (Possible Target: 80% of students graduate within 3 years)

MEASURES	RESULTS	ACTIONS
Graduation count Direct - Counts	<i>No results have been added.</i>	<i>No actions have been added.</i>

Student Retention

Students admitted to the program will persist and continue enrollment toward degree completion. (Possible Target: 85% annual retention rate)

MEASURES	RESULTS	ACTIONS
Continued Program Course Enrollment	<i>No results have been added.</i>	<i>No actions have been added.</i>

Direct - Counts		
Target At least 80% of students enrolled in the MS in Geospatial Sciences program will continue enrollment in program coursework or remain actively enrolled in the program during the subsequent academic year.		

Scholarly and Professional Participation **MET**

Students will engage in professional, research, or service activities that contribute to the geospatial profession. (Possible Target: 30% of students participate in research projects, join professional communities, present at conferences, co-author publications, or earn relevant certifications)

MEASURES	RESULTS	ACTIONS
Participation in research activities or professional organizations Indirect - Other Target At least 50% of enrolled students participated in one or more scholarly or professional activities during the academic year.	MET Summary Dr. Lai continued to help enroll graduate students in the National Honorary Society of Geospatial Science. This year, three MS Geospatial graduate students were sponsored by Dr. Lai to work on internal and externally funded projects, including: • DOE: Southeast Texas Urban IFL: Equitable solutions for communities caught between floods and air pollution • BUDMAC: Lamar University Beneficial Use of Dredge Material Advancement Coalition (BUDMAC) • Cfr Springboard: Geospatial Analysis of the Impact of Floods on Water-Borne Diseases in Southeast Texas	<i>No actions have been added.</i>

Conclusion

The department has continued to support the student organization. Dr. Lai continued to help enroll graduate students in the National Honorary Society of Geospatial Science.

This year, three MS Geospatial graduate students were sponsored by Dr. Lai to work on internal and externally funded projects, including:

- DOE: Southeast Texas Urban IFL: Equitable solutions for communities caught between floods and air pollution
- BUDMAC: Lamar University Beneficial Use of Dredge Material Advancement Coalition (BUDMAC)
- Cfr Springboard: Geospatial Analysis of the Impact of Floods on Water-Borne Diseases in Southeast Texas

Employment or Continued Education **MET**

Graduates will obtain employment in geospatial-related fields or continue advanced education within one year of graduation. (Possible Target: 75% employed in GIS, remote sensing, spatial analytics, environmental consulting, surveying, emergency management, or related sectors within one year.)

MEASURES	RESULTS	ACTIONS
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Student Professional Development Direct - Counts	MET Summary All three of Dr. Lai's research assistants in the MS Geospatial program in Spring 2026 have landed summer internships. They reported that the research project experience gained in Dr. Lai's Geospatial Lab has greatly strengthened their competitiveness in the job market.	<i>No actions have been added.</i>
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Conclusion

All three of Dr. Lai's research assistants in the MS Geospatial program in Spring 2026 have landed summer internships. They reported that the research project experience gained in Dr. Lai's Geospatial Lab has greatly strengthened their competitiveness in the job market.

Program Satisfaction **NOT MET**

Students will report satisfaction with curriculum quality, faculty mentoring, and educational resources.

MEASURES	RESULTS	ACTIONS
Course Evaluation Target The mean student course evaluation score across all MS in Geospatial Sciences courses planned for the first year will be at least 3.5 on a 5-point scale.	MET Summary Program satisfaction is assessed in part through student evaluations of all courses delivered by Dr. Lai, who teaches most of the principal and advanced courses in the MS Geospatial program, except the GPS classes. The graduate classes she taught and evaluated here include: • GEOL5317 Seminars in Geospatial Science (Overall: 5/5, response rate: 25%) • GEOL5311 Principles of GIS (Overall: 4.97/5, response rate: 100%) • GEOL5314 Principles of Remote Sensing (Overall: 5/5, response rate: 33.3%) • GEOL5318 Drone Photogrammetry & App (Overall: 4.72/5, response rate: 80%) • GEOL5312 Advanced GIS Analysis & App (Overall: 4.72/5, response rate: 57.14%) • GEOL5316 Remote Sensing Data & App (No Data, lack of response) Analysis Student evaluations for 2026 show exceptionally strong satisfaction across nearly all courses taught by Dr. Lai in the MS Geospatial program. Five of the six evaluated courses received overall ratings above 4.70/5 , with three courses achieving perfect scores . Response rates varied, but the pattern of high ratings is consistent across both foundational and advanced geospatial coursework. Improvements Compared to the Previous Year	<i>No actions have been added.</i>

The 2026 evaluations demonstrate **clear and measurable improvement** across multiple courses, especially in areas previously identified for enhancement:

1. Significant Improvement in Drone Photogrammetry & Applications

In 2025, this course received the lowest rating (3.88/5) and had a low response rate (50%). In 2026, the course improved to **4.72/5** with a much stronger **80% response rate**.

This reflects:

- Successful implementation of revised course planning
- Better integration of field-based drone operations with in-lab data processing
- Enhanced student support for technically challenging workflows
- Increased student confidence and satisfaction with hands-on components

This is the most notable year-over-year improvement and demonstrates Dr. Lai's responsiveness to student feedback and her ability to refine complex, applied coursework.

2. Strengthening of Core GIS Instruction

Both **Principles of GIS** and **Advanced GIS Analysis & Applications** saw increases in overall satisfaction:

- *Principles of GIS* improved from 4.70 → 4.97
- *Advanced GIS* improved from 4.65 → 4.72

These gains highlight continued excellence in foundational and advanced GIS teaching, with students reporting strong learning outcomes and high satisfaction.

3. Remote Sensing Courses Maintained High Performance

Remote sensing courses remained among the highest-rated:

- *Principles of Remote Sensing* improved from 4.35 → 5.00
- *Remote Sensing Data & Applications* had insufficient data, but previous trends suggest strong performance.

The perfect score in GEOL5314 indicates students found the course highly effective and well-structured.

4. Overall Program Satisfaction Strengthened

Across all evaluated courses, Dr. Lai's 2026 ratings show:

- Higher averages
- More consistent excellence
- Improved student engagement in evaluations

	• Stronger satisfaction in both theory-based and applied courses These improvements reflect a successful year of instructional refinement, curriculum enhancement, and responsive teaching.	
Student Exit Survey Indirect - Survey	NOT MET Analysis There is still a lack of data, as the department is growing and the program is short-staffed, making it difficult to set aside time to manage this.	<i>No actions have been added.</i>

Conclusion

Student evaluations for 2026 show **exceptionally strong satisfaction** across nearly all courses taught by Dr. Lai in the MS Geospatial program. Five of the six evaluated courses received overall ratings **above 4.70/5**, with three courses achieving **perfect scores**. Response rates varied, but the pattern of high ratings is consistent across both foundational and advanced geospatial coursework.

There is a **significant improvement in Drone Photogrammetry & Applications** class. In 2025, this course received the lowest rating (3.88/5) and had a low response rate (50%). In 2026, the course improved to **4.72/5** with a much stronger **80% response rate**. Other improvements include:

- *Principles of Remote Sensing improved from 4.35 → 5.00*
- *Principles of GIS improved from 4.70 → 4.97*
- *Advanced GIS improved from 4.65 → 4.72*

These improvements reflect a successful year of instructional refinement, curriculum enhancement, and responsive teaching. At the same time, the program still **lacks a formal exit survey for graduate students**, which limits its ability to systematically capture post-completion feedback. All faculty are currently operating at full capacity, underscoring the need for future departmental growth. Additional staffing—particularly tenure-track faculty—will be essential to support program expansion, strengthen assessment practices, and ensure the MS Geospatial program can fully realize its potential.

Assessment Report Summary

The MS Geospatial program continues to demonstrate strong momentum and relevance, with clear demand across both local private and public sectors. Faculty from multiple departments and regional agencies have reached out to Lamar's Geospatial Lab (led by Dr. Lai) for long-term collaboration, including requests for interactive web-map development, 3D digital-twin modeling using drone technology, satellite-based water monitoring, and wetland assessment supported by drone mission planning and advanced sensor integration. These partnerships highlight the program's growing reputation as a technical and applied resource for the community.

Student engagement remains a defining strength of the program. Course evaluations consistently reflect high satisfaction, and students actively participate in professional, applied, and research activities. Graduate students also demonstrate strong competitiveness in the job market; notably, all three of Dr. Lai's research assistants in Fall 2026 secured summer internships for 2026, underscoring the program's effectiveness in preparing students for professional success and the need for geospatial techniques among the local industries.

Collectively, the MS Geospatial program represents a valuable asset to the university and aligns strongly with emerging geospatial trends shaping industry and public-sector innovation. To fully realize its potential, however, the program would benefit from stronger outreach and visibility to attract both local and international students. Enhanced recruitment efforts, along with the addition of tenure-track faculty, are essential for supporting sustainable growth. At present, the program remains understaffed, limiting its ability to reach the full value it is capable of delivering.