Geographic Information Systems MS

Goal 1: Prioritize Student Success by delivering a curriculum with appropriate discipline specific knowledge

Goal Description:

One of the primary objectives of the GIS graduate program is to provide appropriate knowledge and technical skills to students so that students are able to develop and demonstrate knowledge of geospatial principles as well as computational and technical skills to enable them to be successful in the geospatial workforce within Texas and beyond.

Students will learn the appropriate advanced Applied GIS and remote sensing knowledge and skills.

Providing Department: Geographic Information Systems MS

Progress: Completed

RELATED ITEMS/ELEMENTS -

RELATED ITEM LEVEL 1

Learning Objective: Demonstrate a thorough understanding of the principles and applications of geospatial techniques and theories

Learning Objective Description:

1. The GIS graduate program will train students in the knowledge and application of geospatial skills who will contribute to SHSU's priorities to expand and elevate the University's service to the State and beyond.
2. All graduate students will demonstrate the ability to communicate knowledge of advanced applied GIS and geospatial principles.
3. All graduate students will have the knowledge and skills to apply/utilize the most advanced geospatial techniques
4. Students will acquire knowledge and skill sets that will make them competitive in the ever evolving geospatial job market within the state and beyond.

RELATED ITEM LEVEL 2

Mastery Of Advanced Applied GIS Knowledge - Written Comprehensive Exams

Indicator Description:

All graduate students will demonstrate a mastery of applied GIS principles and applications through a written graduate comprehensive examination, administered by a committee of three graduate GIS faculty members. The examination will consist of questions about the theory, concepts and applied principles of Geographic Information Systems, Science and Remote Sensing techniques to real world problems and issues. A committee of graduate faculty members who offer graduate courses in the subject areas will evaluate students' performance and give a mark of Fail, Pass, or High Pass in each examined area. The comprehensive exam will evaluate student's understanding of the material covered in all the graduate classes.

Criterion Description:

Each student must earn at least a "Pass" mark in each examined area to pass the written comprehensive exams. Each student is allowed two attempts. Faculty expect that at least 80% of graduate students will pass their exam on their first attempt. 100% will pass on their second attempt.

Findings Description:

Three students took their comprehensive exam in fall 2023. The comprehensive examination committee consisting of the two faculty members who offer graduate GIS classes, and the interim graduate coordinator. A third faculty member who did teach graduate courses had resigned and did not provide questions. Questions for the comprehensive examination were drafted by the student's comprehensive examination committee members. Off the three students who took their exam in fall 2022, one students earned a grade of High Pass in at least one section. All the students earned an overall grade of Pass.

Four more students took their comprehensive exam in spring 2024. Out of the four students, one student earned a grade of High Pass in two sections. All the other students earned a grade of Pass.

RELATED ITEM LEVEL 3

Comprehensive Exam
Action Description:

We will continue to evaluate student progress in the graduate program based on an intensive comprehensive exam. As indicated by results of the comprehensive exams our graduate students have been exposed to a variety of theoretical and practical concepts and principles in GIS. However, results of this assessment, combined with conversations with alumni and potential employers, has led to the conclusion that our the graduate program is due for a re-evaluation. Employment in the GIS industry now requires additional technical skills and experience with a more diverse array of applications. Coincidentally, two additional GIS faculty have been hired who will be offering graduate GIS courses. In short, we will be redeveloping and upgrading our program and its course offerings.

We will continue with the format for the comprehensive exam. We will also look at the results of the comprehensive exam to evaluate which areas we need to develop better methods.

RELATED ITEM LEVEL 3

Mastery Of Advanced Applied GIS Knowledge
Action Description:

We will continue to offer advanced GIS courses that enhance the marketability of our graduate students in the GIS job industry. Based on feedback received from industry experts, we have begun incorporating updated and modern GIS applications. All courses going forward will utilize the latest available version of ArcGIS Pro. These up-to-date applications are now required for students to be competitive in the job market. We will also offer new applied courses, such as Environmental Applications of Python Programming and GIS & Urban and Regional Planning. Additionally, we will continue to review plans for upgrading to the next generation of Remote Sensing software.

We will continuously evaluate how these changes impact student degree plans and their progress. The effects of these changes will be more readily assessed in the next few years.

We are also evaluating the future format of new graduate course offerings. In recent years, our program has offered course options for students requiring and preferring face-to-face instruction, as well as courses for students enrolled in a fully online professional track. However, given the recent growth in demand for undergraduate GIS courses and the increase in our international student population, offering a fully online degree is no longer sustainable. We will be pausing the acceptance of students into the fully online degree until we can re-evaluate and reassess are available human resources.

GIS is an applied field; therefore, we must ensure that our hardware and software are up-to-date and using the most current versions. To achieve this, the graduate program heavily relies on support from SHSU IT. We will also hire a full-time GIS Lab Technician starting Fall 2024, who

will assist with the technical support required across the program.

Acquire the most up to date geospatial infrastructure for graduate students to be workforce ready
Performance Objective Description:

The graduate program will make all efforts to acquire and install the latest geospatial infrastructure so that we are able to provide our graduate students with the knowledge and training that prepares them in every way for the job market or pursue a doctoral degree. This will support the graduate program's goal to prioritize graduate student success, embody a culture of excellence within the graduate program and train students to be ready for the job market who contribute to the economy, and thereby elevate our service to the State and beyond.

Comprehensive exams
KPI Description:

Students are required to take a comprehensive exam which will evaluate their mastery of geospatial principles and applications. Students must successfully pass the exam in order to graduate with a Master's degree. The comprehensive exam will also examine their readiness in using the most updated geospatial platform to ensure they are prepared for the competitive workforce and enhance the reputation of our graduate program.

Target Description:

At least 80% of graduate students taking their comprehensive exam will pass their exam on their first attempt. 100% will pass on their second attempt.

Results Description:

Three graduate students took their comprehensive exam in fall 2023 and four more took their comprehensive exam in spring 2024. In fall we had one student who had earned a grade of High Pass in one section and all the other students passed the comprehensive exam in their first attempt with a grade of Pass. In spring, one student earned a grade of High Pass and all the other students passed the comprehensive exam in their first attempt with a grade of Pass.

Comprehensive Exam
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We will continue with the format for the comprehensive exam. We will also look at the results of the comprehensive exam to evaluate which areas we need to develop better methods.

Goal 2: Prioritize Student success by upgrading to ArcGIS Enterprise as the licensing mechanism and user management system for GIS graduate classes

Goal Description:

In order to ensure that students who graduate with a Master's degree in GIS are competitive in the job market the next primary goal of the graduate program is to impart curriculum utilizing the most updated GIS technology that includes ArcGIS Pro and ArcGIS Online, part of ArcGIS Enterprise. Most employers in the state expect students with a master's degree in GIS to have expertise in these application platforms.

Providing Department: Geographic Information Systems MS

Progress: Completed

Learning Objective: Demonstrate a thorough understanding of the principles and applications of geospatial techniques and theories

Learning Objective Description:

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Mastery Of Advanced Applied GIS Knowledge
Action Description:

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Acquire the most up to date geospatial infrastructure for graduate students to be workforce ready
Performance Objective Description:

The graduate program will make all efforts to acquire and install the latest geospatial infrastructure so that we are able to provide our graduate students with the knowledge and training that prepares them in every way for the job market or pursue a doctoral degree. This will support the graduate program's goal

to prioritize graduate student success, embody a culture of excellence within the graduate program and train students to be ready for the job market who contribute to the economy, and thereby elevate our service to the State and beyond.

Comprehensive exams

KPI Description:

Students are required to take a comprehensive exam which will evaluate their mastery of geospatial principles and applications. Students must successfully pass the exam in order to graduate with a Master's degree. The comprehensive exam will also examine their readiness in using the most updated geospatial platform to ensure they are prepared for the competitive workforce and enhance the reputation of our graduate program.

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Comprehensive Exam

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We will continue with the format for the comprehensive exam. We will also look at the results of the comprehensive exam to evaluate which areas we need to develop better methods.

Goal 3: Embody a culture of excellence by recruiting efforts for the graduate program

Goal Description:

The program will continue efforts to recruit quality students for the graduate program to embody a culture of excellence within the graduate program. The graduate program will reach out for assistance from the University for those efforts.

Providing Department: Geographic Information Systems MS

Progress: Completed

Learning Objective: Demonstrate a thorough understanding of the principles and applications of geospatial techniques and theories

Learning Objective Description:

1. The GIS graduate program will train students in the knowledge and application of geospatial skills who will contribute to SHSU's priorities to expand and elevate the University's service to the State and beyond.
2. All graduate students will demonstrate the ability to communicate knowledge of advanced applied GIS and geospatial principles.
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Mastery Of Advanced Applied GIS Knowledge - Written Comprehensive Exams

Indicator Description:

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Criterion Description:

Each student must earn at least a "Pass" mark in each examined area to pass the written comprehensive exams. Each student is allowed two attempts. Faculty expect that at least 80% of graduate students will pass their exam on their first attempt. 100% will pass on their second attempt.

Findings Description:

Three students took their comprehensive exam in fall 2023. The comprehensive examination committee consisting of the two faculty members who offer graduate GIS classes, and the interim graduate coordinator. A third faculty member who did teach graduate courses had resigned and did not provide questions. Questions for the comprehensive examination were drafted by the student's comprehensive examination committee members. Off the three students who took their exam in fall 2022, one students earned a grade of High Pass in at least one section. All the students earned an overall grade of Pass.

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Comprehensive Exam

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We will continue with the format for the comprehensive exam. We will also look at the results of the comprehensive exam to evaluate which areas we need to develop better methods.

Mastery Of Advanced Applied GIS Knowledge
Action Description:

We will continue to offer advanced GIS courses that enhance the marketability of our graduate students in the GIS job industry. Based on feedback received from industry experts, we have begun incorporating updated and modern GIS applications. All courses going forward will utilize the latest available version of ArcGIS Pro. These up-to-date applications are now required for students to be competitive in the job market. We will also offer new applied courses, such as Environmental Applications of Python Programming and GIS & Urban and Regional Planning. Additionally, we will continue to review plans for upgrading to the next generation of Remote Sensing software.

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GIS is an applied field; therefore, we must ensure that our hardware and software are up-to-date and using the most current versions. To achieve this, the graduate program heavily relies on support from SHSU IT. We will also hire a full-time GIS Lab Technician starting Fall 2024, who will assist with the technical support required across the program.

Recruit quality graduate students to embody a culture of excellence within the graduate program
Performance Objective Description:

The graduate program will continue all efforts to recruit quality students who join the GIS graduate program and work with faculty members on research projects to embody a culture of excellence within the graduate program.

Comprehensive exams
KPI Description:

Students are required to take a comprehensive exam which will evaluate their mastery of geospatial principles and applications. Students must successfully pass the exam in order to graduate with a Master's degree. The comprehensive exam will also examine their readiness in using the most updated geospatial platform to ensure they are prepared for the competitive workforce and enhance the reputation of our graduate program.

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RELATED ITEM LEVEL 3

Comprehensive Exam

Action Description:

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We will continue with the format for the comprehensive exam. We will also look at the results of the comprehensive exam to evaluate which areas we need to develop better methods.

Goal 4: Embody a culture of excellence and conduct research and publish to bring greater visibility to the GIS graduate program.

Goal Description:

An important component of graduate teaching is research and publication. We will continue with our efforts to conduct research and publish in well respected peer reviewed journals and focus on involving graduate students in research activities.

Providing Department: Geographic Information Systems MS

Progress: Completed

RELATED ITEMS/ELEMENTS -

RELATED ITEM LEVEL 1

Learning Objective: Demonstrate a thorough understanding of the principles and applications of geospatial techniques and theories

Learning Objective Description:

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Mastery Of Advanced Applied GIS Knowledge - Written Comprehensive Exams
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Comprehensive Exam
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Action Description:

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GIS is an applied field; therefore, we must ensure that our hardware and software are up-to-date and using the most current versions. To achieve this, the graduate program heavily relies on support from SHSU IT. We will also hire a full-time GIS Lab Technician starting Fall 2024, who will assist with the technical support required across the program.

Goal 5: Train graduate students who will expand and elevate our service to the State and beyond

Goal Description:

An important goal of the GIS graduate program is to train students who are well prepared for a competitive job market and contribute positively to the State and beyond. This will also enhance their upward social mobility.

Providing Department: Geographic Information Systems MS

Progress: Completed

RELATED ITEMS/ELEMENTS -

RELATED ITEM LEVEL 1

Learning Objective: Demonstrate a thorough understanding of the principles and applications of geospatial techniques and theories

Learning Objective Description:

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RELATED ITEM LEVEL 2

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RELATED ITEM LEVEL 3

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RELATED ITEM LEVEL 1

Acquire the most up to date geospatial infrastructure for graduate students to be workforce ready
Performance Objective Description:
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RELATED ITEM LEVEL 2

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We will continue with the format for the comprehensive exam. We will also look at the results of the comprehensive exam to evaluate which areas we need to develop better methods.

Update to Previous Cycle's Plan for Continuous Improvement Item

Previous Cycle's Plan For Continuous Improvement (Do Not Modify):

Closing Summary

As last year we will continue efforts to be able to offer courses that use latest version of GIS software. The GIS industry has upgraded to a new GIS software, ArcGIS Pro and the use of cloud based solution, ArcGIS Online for Organizations. We will continue reviewing efforts to offers courses that use ArcGIS pro instead of ArcGIS desktop and ArcGIS Online instead of ArcGIS Server. All employers expect students with a Master's degree in GIS to be familiar with these two GIS platforms as indicated by reviews submitted by employers where we had GIS graduate students either engaged in an internship or a fulltime job. Upgrading to an ArcGIS Enterprise as the licensing mechanism and user management system is a rather large endeavor and will require the department to work closely with SHSU IT for campus wide installation. We will work very closely with the IT department to overcome the technical hurdles faced when offering such courses on campus. We have started preliminary conversations with IT. Currently, a faculty member also performs the role of a GIS software administrator. In order to provide our graduate students instruction using the latest technology we have to upgrade the technology. We will evaluate plans to bring on-board a GIS software administrator atleast on a part-time basis.

We are also looking at including drone technology and data processing captured by means of drone into our graduate course offerings. The department has acquired a high quality drone that will be incorporated into graduate teaching. Moreover, we have a new faculty member joining the department in fall 2023. The faculty member specializes in remote sensing and we are looking forward to offering new graduate course/s in their area of specialization.

Currently all our graduate students have been successful in procuring an internship or a full time job opportunity by the time they are in their second year of the program. Students who were working fulltime when they joined the graduate program have progressed in their career by the time they graduate from the Master's program. As per reviews submitted by employers where GIS graduate students were engaged in an internship opportunity or working fulltime, employers are very pleased with the technical and conceptual competence of our graduate students.

We will also continue to evaluate student progress by administering a comprehensive exam typically taken during the third semester and by using final projects in all GIS graduate courses. The comprehensive exams are a very useful tool in examining student learning in the graduate program. Students are given either a High Pass, Pass or Fail. Students who fail the exam must re-take the exam in their next semester. Most of the students have passed the exam with a grade of Pass. Very few students earn a grade of High Pass. We will continue to monitor students who earn a grade of Fail and also examine the underlying reasons.

Another tool used to evaluate student learning are projects. All graduate students must work on final projects in every graduate course. Students work individually on these projects to demonstrate their understanding of the course material and their ability to apply that material in a real-world scenario. Final projects are a key component of a student's final grade.

The number of international students who were able to join the program has taken a hit due to the pandemic. The graduate program in collaboration with the Office of International Programs and Graduate Admissions will continue to work towards strategies that make it easier for good quality international students to join the program after they are accepted.

An important component of graduate teaching is research and publication. We will continue with our efforts to conduct research and publish in peer reviewed journals. Such activities bring visibility to the program, department, College and the University.

Update of Progress to the Previous Cycle's PCI:

During this latest assessment period, the department collaborated with SHSU IT to implement the latest version of ArcGIS Pro software. While the process was not entirely smooth, this updated software was ultimately fully integrated into all GIS courses. We no longer rely on a faculty member to serve as the GIS software administrator, as a full-time staff member was hired to fulfill these duties.

A new faculty member with expertise in drone technology joined the department in Fall 2023. They will begin incorporating high-quality drone technology into graduate-level teaching in Fall 2024. We expect the use of this technology to become more fully integrated across both the undergraduate and graduate programs going forward.

Our graduate students continue to successfully pursue and secure internship and full-time employment opportunities as they complete the program or near degree completion.

We continued to utilize the comprehensive exam as a means to assess student learning. Once again, our students successfully completed this exam to a high degree. We will also continue to evaluate student success and monitor students who earn a failing grade, examining the underlying reasons.

Recognizing that experience with research projects is a critical component of a graduate degree, we decided to offer a new course focusing specifically on Project Formation. Students enrolled in this course will spend the entire semester working on all steps required for completing a GIS project (research formulation, data access, data management, analysis, etc.).

Now that travel restrictions have been relaxed, we have begun receiving an increased number of applications from international students. The graduate program, in conjunction with COSET, has continued to collaborate with the Office of International Programs and Graduate Admissions to develop strategies that facilitate the enrollment of high-quality international students after their acceptance.

Plan for Continuous Improvement Item

Closing Summary:

The graduate program is undergoing redevelopment and reformulation. This process was partially driven by the continued need to update the curriculum and associated software applications. It was also driven by changes in personnel. In recent years, two faculty members devoted to the graduate program resigned. One of these faculty members was responsible for nearly half of the course offerings and also served as the program coordinator. We have since replaced both faculty lines, and the program is being managed by an interim graduate coordinator. Given these changes, there will be a need for the development of several new courses and new initiatives when it comes to program management, marketing, advising, and student recruitment. The program assessment will also be adjusted going forward.

Consistent with previous years, we will continue efforts to offer updated and relevant courses that utilize the latest version of GIS software. ArcGIS Pro will be fully implemented across the program, as will the latest remote sensing software and drone technology. We will continue reviewing efforts to ensure that software and hardware needs are identified and met. A newly hired GIS Software Administrator will now be available to assist with technological needs and troubleshooting.

A new emphasis will be placed on student mentoring and advising. In the past, all graduate students were advised by the graduate coordinator. Beginning in Fall 2024, graduate student advising will be a collective effort among the GIS faculty, with each faculty member being assigned a small number of graduate students. More collaborative efforts will also be used for all aspects of the program, such as recruitment, application review, marketing, and assessment.

There has been a significant increase in the demand for undergraduate GIS skills. For example, the department now operates two separate interdisciplinary programs that are at least somewhat focused on the application of geospatial technology (crime mapping, in collaboration with criminal justice, and precision agriculture). Accordingly, more of the department's focus is needed to meet this demand. We have decided that meeting the demand for a fully online (100%) professional master's degree is simply not sustainable at this time, at least not without compromising the undergraduate needs across campus. We will continue to serve graduate students currently enrolled in the professional track but will pause the acceptance of new students into this fully online program.

The Applied GIS Graduate program is scheduled to undergo external review in 2024-25. We fully expect that this review will provide an opportunity to formulate the best program we can offer to meet the needs of our students, the university, the region, and the state.