SAINT LOUIS UNIVERSITY.

Program-Level Assessment: Annual Report

Program Name (no acronyms): MS in Geographic Information Science

Department: EAS

Degree or Certificate Level: Master's

College/School: Arts and Sciences

Date (Month/Year): 08/2021

Assessment Contact: Zachary Phillips, Vasit Sagan

In what year was the data upon which this report is based collected?

2020-2021

In what year was the program's assessment plan most recently reviewed/updated?

2018

1. Student Learning Outcomes

Which of the program's student learning outcomes were assessed in this annual assessment cycle? (Please list the full, complete learning outcome statements and not just numbers, e.g., Outcomes 1 and 2.)

1. Graduates will be able to discuss how GIS and remote sensing is used to investigate problems related to sustainability and environmental science.
2. Graduates will be able to demonstrate the use of relational database management systems as applied to geospatial data.
3. Graduates will be able to demonstrate effective cartographic/geovisualization skills employing principles of map design and graphic representation techniques.
4. Graduates will be able to describe and interpret remote sensing spectra and imagery.
5. Graduates will be able to perform supervised, unsupervised and object based classification techniques using remote sensing data.

2. Assessment Methods: Artifacts of Student Learning

Which artifacts of student learning were used to determine if students achieved the outcome(s)? Please describe and identify the course(s) in which these artifacts were collected. Clarify if any such courses were offered a) online, b) at the Madrid campus, or c) at any other off-campus location.

1. The artifacts used to assess learning outcomes are written and presentation portions of final projects in GIS 5010, GIS 5040, GIS 5050, and GIS 5092. If written sections of student projects are of passing quality, the student shows adequate learning progress in the Student Learning Outcome listed.
2. The artifacts used to assess learning outcomes are the Data Management Lab (Chapter 4) in GIS 5010 and the Relational Database Labs (Labs 5 and 6) in GIS 5030 - Geospatial Data Management. Successful completion of these labs show adequate development of Relational Database Management Systems skills.
3. The artifacts used to assess learning outcomes are the Cartography and map-making labs and assignments (Chapter2 and 3) in GIS 5010, and the Final Projects for GIS 5080.
4. The artifacts used to assess learning outcomes are Final Projects in GIS 5040, GIS 5050, ECE 5153, and GIS 5092.
5. The artifacts used to assess learning outcomes are Remote Sensing Image Classification Labs (Labs 10 in GIS 5040, Labs 8 and 9 in GIS 5050)

3. Assessment Methods: Evaluation Process

What process was used to evaluate the artifacts of student learning, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and **include them in/with this report document** (do not just refer to the assessment plan).

1. Student learning is evaluated by collecting percent of failing grades for final projects. Evaluations are conducted by Drs. Vasit Sagan and Zach Phillips. Students pass the assessment if they pass their final project. Students are further evaluated for their discussion skills using written/presentation portions of the final projects if their overall final project score is failing. If failing grades are over 7% of total, changes to curriculum are made.
2. Student learning is evaluated by assessing grades for the specified artifacts. If failing grades are over 7%, adjustments to the curriculum is made through consultation with local remote sensing professionals. Evaluations are conducted by Drs. Vasit Sagan and Zach Phillips.
3. Student learning is evaluated by assessing pass/fail percentages for the specified artifacts in GIS 5010, and the Final Projects for GIS 5080. If failing grades are over 7% of the total, adjustment to the curriculum is made through consultation with local GIS professionals. Evaluations are conducted by Drs. Vasit Sagan and Zach Phillips.
4. Student learning is evaluated by assessing pass/fail percentages for the specified artifacts in GIS 5040, GIS 5050, ECE 5153, and GIS 5092. If failing grades are over 7% of the total, adjustment to the curriculum is made through consultation with local remote sensing professionals. Evaluations are conducted by Drs. Vasit Sagan and Zach Phillips.
5. Student learning is evaluated by assessing pass/fail percentages for the specified artifacts in GIS 5040 and 5050. If failing grades are over 7% of the total, adjustment to the curriculum is made through consultation with local remote sensing professionals. Evaluations are conducted by Drs. Vasit Sagan and Zach Phillips.

4. Data/Results

What were the results of the assessment of the learning outcome(s)? Please be specific. Does achievement differ by teaching modality (e.g., online vs. face-to-face) or on-ground location (e.g., STL campus, Madrid campus, other off-campus site)?

1. Of 16 students assessed over five artifacts, the percentage of failures in the learning artifacts for SLO 1 was 4.5% (4 of 90 artifacts were failed). Failing grades were evenly dispersed between online asynchronous and in-person classes and are sometimes because of failure to submit work and not bad quality. Failing of artifacts is typically repeated by the same student and not dispersed amongst students. Courses were not taught at Madrid Campus.
2. Of 18 students assessed over three artifacts, the percentage of failures across the artifacts for SLO 2 was 3.7 % (2 of 54 artifacts failed). Failing grades were evenly dispersed between online asynchronous and in-person classes. Courses were not taught at Madrid Campus.
3. Of 17 students assessed over two artifacts, the percentage of failures across the artifacts for SLO 3 was 3% (1 of 34 artifacts failed). Failing grades were evenly dispersed between online asynchronous and in-person classes. Failing grades were evenly dispersed between online asynchronous and in-person classes and are sometimes because of failure to submit work and not bad quality. Courses were not taught at Madrid Campus.
4. Of 15 students assessed over four artifacts, the percentage of failures across the artifacts for SLO 4 was 3.3% (2 of 60 artifacts failed). Failing grades were evenly dispersed between online asynchronous and in-person classes. Courses were not taught at Madrid Campus.
5. Of 12 students assessed over three artifacts, the percentage of failures across the artifacts for SLO 5 was 2.7% (1 of 36 artifacts failed).

5. Findings: Interpretations & Conclusions

What have you learned from these results? What does the data tell you?

These results show that student performance fulfills the learning outcomes outlined for each measured course. They point to various levels of understanding in GIS and Remote sensing, including a mix of basic concepts, intermediate-level material, and higher level understandings. Given our approach of forming our classes curriculum, which was by consulting with industry professionals, data show that students are able to perform up to standards of professionals across the region.

6. Closing the Loop: Dissemination and Use of Current Assessment Findings

A. When and how did your program faculty share and discuss these results and findings from this cycle of assessment?

Dr. Sagan and Dr. Phillips shared the results of this year's assessment over Summer 2021, and discussed them face to face in the office.

B. How specifically have you decided to use these findings to improve teaching and learning in your program? For example, perhaps you've initiated one or more of the following:

Changes to the Curriculum or Pedagogies	• Course content • Teaching techniques • Improvements in technology • Prerequisites	• Course sequence • New courses • Deletion of courses • Changes in frequency or scheduling of course offerings
Changes to the Assessment Plan	• Student learning outcomes • Artifacts of student learning • Evaluation process	• Evaluation tools (e.g., rubrics) • Data collection methods • Frequency of data collection

Please describe the actions you are taking as a result of these findings.

Continuing to expand our course offerings due to positive results with current offerings.

If no changes are being made, please explain why.

Because we have recently reformed the required course work for the GIS Degree as of 2020, these results show that the newly designed courses and requirements are fulfilling our goals of training to industry standards. We are moving on to focus on the development of new courses as the Geospatial Institute continues to grow.

7. Closing the Loop: Review of Previous Assessment Findings and Changes

A. What is at least one change your program has implemented in recent years as a result of assessment data?

In 2020, GIS 5020 (Intermediate GIS) and GIS 5060 (Geospatial Methods) were closed and replaced by GIS 5030 (Geospatial Data Management) and GIS 5050 (Digital Image Processing).

B. How has this change/have these changes been assessed?

This is the first year of assessment data collected on these changes, and on new assessment criteria.

C. What were the findings of the assessment?

This year's assessment shows initial positive results for course changes made in 2020.

D. How do you plan to (continue to) use this information moving forward?

This first year of assessments will be compared to further years for monitoring of student learning. Constant input is sought from Industry Professionals in GIS and Remote Sensing.

IMPORTANT: Please submit any assessment tools (e.g., rubrics) with this report as separate attachments or copied and

pasted into this Word document. Please do not just refer to the assessment plan; the report should serve as a stand-alone document.