Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Geology	276	GLG 276 03/03/2025-Principles of Geographic Information Systems
College	Division	Department
Math, Science and Engineering Tech	Math, Science and Engineering	Physical Sciences
Faculty Preparer		Emily Duff
Date of Last Filed Assessment Report		11/18/2019

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   Fall 2019

2. Briefly describe the results of previous assessment report(s).

   All standards of success were met.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   In the previous assessment, language for the assessment tools and learning outcomes were changed and are still in use today. Based on instructor and student feedback, the textbook was changed in Winter 2023. This assessment reflects those changes.

II. Assessment Results per Student Learning Outcome

Outcome 1: Recognize introductory principles and concepts related to geographic information systems.

- Assessment Plan
  - Assessment Tool: Module quizzes
  - Assessment Date: Winter 2022
  - Course section(s)/other population: All sections
  - Number students to be assessed: All students

- How the assessment will be scored: Multiple-choice questions will be scored using the key. Essay and short answer questions will be scored using a departmentally-developed rubric.
- Standard of success to be used for this assessment: 70% of students will score an overall average score of 72.5% or better on each assessment question.
- Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2024		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
15	13

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Students who did not complete assignments or finish the class are not included in this assessment.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students from the Fall 2024 (MM) section are included in this assessment. Only those who did not complete a given assignment or complete the class are excluded.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The module quizzes, provided by the publisher, consist of multiple-choice questions based on the chapter readings. Students are given a randomly drawn set of 15 questions. The quiz is not timed, and the students have one attempt. The multiple-choice quizzes are assessed using an answer key.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this

learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Yes. Of the students completing the module quizzes, the standard of success (70% of the class received 72.5%) was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

These are low-stakes assignments to familiarize the students with the basic introductory concepts of GIS. Those who complete the quiz generally do well on the accompanying map exercise (map construction and related questions). The quizzes assess only the current module material while the map exercises are cumulative in nature.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The standard of success was met overall. These low-stakes, but high quality assignments help students become familiar with the ideas and skills used in the map exercise and should be continued. Supplemental materials could be provided and encouragement to complete the assignments on time.

Outcome 2: Apply appropriate principles and concepts to solve problems, as well as construct maps, charts, diagrams and graphs using the ArcGIS software.

- Assessment Plan
    - Assessment Tool: Capstone project
    - Assessment Date: Winter 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Project will be scored using a departmentally-developed rubric.
    - Standard of success to be used for this assessment: 75% of students will score a 2.5/4 (62.5%) or higher on the rubric.
    - Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2024		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
15	11

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

In the of Fall 2024 semester, 11 students completed part or all the final project. Students who did not participate in this assignment were excluded.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students enrolled and who completed the final project are included in this assessment.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

This project, which includes three maps and a brief write-up for each, was scored using a departmentally developed rubric. The assignment is based on previous modules and captures all the critical elements learned throughout the class.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
The current master syllabus states that 75% of students will receive a 62.5% or higher. Based on this metric, all sections and modalities met the standard of success. This standard will be updated in the newest master syllabus to align with the other assessment tools for this course. With that in mind, the overall average met the pending standard of success of 70% of students receiving 72.5% on the assignment.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The standard of success was met. The project consists of multiple parts (three maps and brief write-ups), so if one map is not completed, a student's grade would drop automatically to 75%. Though students have three weeks to complete this assignment, many wait until the last minute and simply run out of time to complete the more advanced (and higher weighted) portions of the assignment. 80% of the students who completed the final project received a 72.5% or higher.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

This is a strong project that incorporates main concepts from all modules of the course. The idea is to give little direction or help so that the students can demonstrate that they have learned these important concepts. Everything is a spin on an earlier map exercise, so the textbook and lecture videos are a vital tool. Perhaps to encourage completion, the three main parts of the final project should be divided between the final three weeks of the course.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

We are still using the same student learning outcomes though we have changed the textbook based on instructor and student feedback. This assessment reflects those changes.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

Overall, I am pleased with the success of the students meeting the course objectives and outcomes. When considering students who have completed at least 40% of the course material, the average grade is about 80%. There are still opportunities to improve. One area of improvement is to possibly spread out the three parts of the final project, having one part due in each of the weeks leading up to the end of the semester. I knew students skipped the final project, but I'm surprised at how many over the course of the three semesters did. It's not a difficult project if students have completed the map exercises, but it does take time. The spread-out deadlines would help them complete the full project as each of the three parts would be like completing a typical week's worth of work.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

The report will be shared in an upcoming department meeting.

4.

Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Outcome Language	SLO 2, Assessment 1- Standard of success to be used for this assessment: 70% of students will score a 72.5% or higher on the rubric.	Align with other assessment tool outcomes for this course.	2025
Assessment Tool	Spread out the deadlines for the final project	Students routinely do not complete the final project though they are given three weeks to complete three maps. Creating separate deadlines for each portion (map and write-up) would force the students to stay on top of the assignment and we will perhaps see stronger outcomes.	2025

5. Is there anything that you would like to mention that was not already captured?

I would like to thank Sue Albach, Physical Sciences department chair, for reading the draft assessment report.

III. Attached Files

GLG 276 Assessment Data

Faculty/Preparer:	Emily Duff	**Date:** 03/04/2025
Department Chair:	Suzanne Albach	**Date:** 03/04/2025
Dean:	Tracy Schwab	**Date:** 03/05/2025
Assessment Committee Chair:	Jessica Hale	**Date:** 03/17/2026

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Geology	276	GLG 276 08/18/2019- Principles of Geographic Information Systems
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Physical Sciences	Suzanne Albach
Date of Last Filed Assessment Report		

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   No

2. Briefly describe the results of previous assessment report(s).

   3.

4. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   5.

II. Assessment Results per Student Learning Outcome

Outcome 1: Recognize and identify introductory principles and concepts related to geographic information systems.

- Assessment Plan
  - Assessment Tool: Departmental Exams
  - Assessment Date: Winter 2017
  - Course section(s)/other population: All sections
  - Number students to be assessed: Random sample of 50% from each section offered with a minimum of one full section.

- How the assessment will be scored: Multiple choice questions will be scored using the key. Essay and short answer questions will be scored using a departmentally-developed rubric.
- Standard of success to be used for this assessment: Students will score an overall average score of 72.5% or better on each assessment question.
- Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
11	10

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

One student failed to complete the semester.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Only one section of this class was offered during the Winter 2019 semester, and that was a mixed-mode day class.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The current master syllabus for this course states that we will use departmental exams to assess this outcome. With a new course developer assigned to teach this course, the assessment tool for this outcome changed from exams to using module quizzes to assess this outcome. In total, there were eleven module quizzes given over the semester. Multiple-choice questions were scored using a key. The basis for our standard of success is that at least 70% of students will score an average of at least 72.5% on each module exercise. These changes will be reflected in the master syllabus revision, along with sample quiz questions.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Across the eleven module quizzes given, students scored an overall average of 84.5%, meeting the standard of success. Specific module quiz results were analyzed as well, and students met the standard for success for all quizzes except the Module 10 Quiz, which covers map overlay and geoprocessing. The attached datasheet will show the results of the individual module quizzes.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The results of the module quizzes show that students have met our standard for success in ten of the eleven modules. Analyzing the average for each of the module quizzes really helps to indicate the modules where students are excelling, such as in Modules 3: Coordinate Systems (95.6%); Module 5: Presenting GIS Data (90.4%); Module 7: Basic Editing (90.1%); and Module 11: Raster Analysis (100%). This allows us to concentrate and improve on the other modules.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

While students met the standard of success for ten of the eleven module quizzes, the quiz for Module 10, covering map overlay and geoprocessing, fell short of our standard of success with an average class score of 67.2%. Additional material will be added and reinforced in this module to help improve success in future semesters. In addition, the attached data will show that Modules 1: Introduction to GIS (79.1%); Module 8: Queries (78.1%); and Module 9: Spatial Joins (77.8%) are also in need of supplemental material as these quizzes all averaged below 80%. While we met the standard for success overall, reinforcing and supplementing these modules with additional material will encourage further improvement and continued student success.

Outcome 2: Apply appropriate principles and concepts to solve problems, as well as construct maps, charts, diagrams and graphs using the ArcGIS 10 software.

- Assessment Plan
    - Assessment Tool: Portfolio
    - Assessment Date: Winter 2017

- Course section(s)/other population: All sections
- Number students to be assessed: Random sample of 50% from each section offered
- How the assessment will be scored: Portfolio will be scored using a departmentally-developed rubric.
- Standard of success to be used for this assessment: 75% of students will score a 2.5 (between acceptable and good) or above on a rubric scale of not acceptable (1), acceptable (2), good (3), and exemplary (4).
- Who will score and analyze the data: department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
11	10

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

One student failed to complete the semester.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Only one section of this class was offered during the Winter 2019 semester, and that was a mixed-mode day class.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The current master syllabus for this course states that we will use a portfolio to assess this outcome. With a new course developer assigned to teach this course, the assessment tool for this outcome changed from using a portfolio to assess this outcome to using two different tools to measure student success. The first tool used is module exercises, and the second tool used is the capstone project. These

changes will be reflected in the forthcoming master syllabus revision for this course.

The module exercises combine the principles and skills learned in each module to show mastery of the module material. The basis for our standard of success is that at least 70% of students will score an average of at least 72.5% on each module exercise. Module exercises were scored using a key. Examples of the chapter exercises will be attached to the master syllabus revision for this course.

In the capstone project, students synthesize the information and techniques learned over the entire course to solve a problem using spatial analysis. Our standard of success is that at least 70% of students will score an average of at least 72.5% on the capstone project. The capstone project was scored using a rubric, which will be attached to the master syllabus revision.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Across the eleven module exercises given, students scored an overall average of 95.3%, meeting the standard of success. Specific module exercise results were analyzed as well, and students met the standard for success for all module exercises except the Module 7 exercise, which covers basic editing using ArcGis software. The attached datasheet will show the results of the individual module exercises. As far as the capstone project, our second assessment tool for this outcome, students scored an average of 98.9%, also meeting our standard of success.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The results of the first assessment tool, the module exercises, show that students have met our standard for success in ten of the eleven modules. Analyzing the average for each of the module quizzes really helps to indicate the modules where students are excelling for this outcome, which includes all module exercises, except Module 7: Basic Editing (70.4%). Knowing this allows us to concentrate and improve on this module.

The results of the second assessment tool, the capstone project, shows that students have overwhelmingly met our standard of success. We attribute this to having multiple stages of learning before students complete this final capstone project. The attached datasheet will show this, as well. After learning the material, the students take module quizzes. Students scored an overall average of 84.5% at

this stage. Next, students apply that knowledge to learn specific skills in using the ArcGIS software. Students scored an overall average of 93.1% at this stage, showing improvement. Finally, students are then tested through module exercises, where knowledge and skills are fully joined, and students had an overall average of 95.3% at this stage, showing even greater improvement. The capstone project is an extension of the module exercises but includes material from the entire course, so a class average of 98.9% success shows the educational plan we have in place is working for the majority of students.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

While students met the standard of success for ten of the eleven module exercises, exercises for Module 7, basic editing, fell short of our standard of success with an average class score of 70.4%. Additional material will be added and reinforced in this module to help improve success in future semesters. No other module exercises showed a need for changes.

While we met the standard for success for the capstone project, reinforcing and supplementing a few of the modules with additional learning material will encourage further improvement and continued student success.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

N/A

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

In looking closely at each component, the modules that students had some struggles with were highlighted, and that allows us to reinforce the learning material in those modules to help improve future student success.

Also, analyzing the successive steps in the learning process show this method of learning is working for the majority of our students. It was especially encouraging to see the percentage of students succeeding at each level increase all the way through the capstone project.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

The data and results have been shared with appropriate geology faculty, especially the current course developer, Adam Skyles, so that we could discuss and implement appropriate steps to continue the success rate in this course and to address the areas where we could improve.

4.

Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Outcome Language	For the second outcome, "Apply appropriate principles and concepts to solve problems, as well as construct maps, charts, diagrams, and graphs using the ArcGIS 10 software". The language will be changed to "Apply appropriate principles and concepts to solve problems, as well as construct maps, charts, diagrams, and graphs using ArcGIS software".	Removing the "ArcGIS 10 software" and replacing it with "ArcGIS Software" eliminates the problem of the program changing names with updates. For example, the current version of the software used is "ArcGIS Pro".	2019
Assessment Tool	For the first outcome, "Recognize and identify introductory principles and concepts related to geographic information systems", we will replace the departmental exams with module quizzes.	For the format of this course, a series of shorter quizzes given throughout the course is more effective than using a larger, high-stakes comprehensive exam. Frequent testing boosts learning and helps students with more immediate feedback on areas where they	2019

		may need additional help before progressing on to learning the next set of skills in this class.	
Assessment Tool	For the second outcome, "Apply appropriate principles and concepts to solve problems, as well as construct maps, charts, diagrams, and graphs using the ArcGIS 10 software", we will replace the portfolio with a capstone project.	For the format of this course, a capstone project better shows how students can synthesize the information and techniques learned in the course to solve a problem using spatial analysis. This capstone project will better show how appropriate principles and concepts were applied, which were learned over the course of the semester, to construct maps and other visuals using the ArcGIS software to solve a problem.	2019
Assessment Tool	For the second outcome, "Apply appropriate principles and concepts to solve problems, as well as construct maps, charts, diagrams, and graphs using the ArcGIS 10 software", we will add a second assessment tool to	The chapter exercises combine the principles learned in the modules with the skills learned with using the ArcGIS software to show how students have applied appropriate principles and concepts to solve problems, as well as	2019

	go along with the capstone project, which is the exercises given with each module.	construct maps, charts, diagrams, and graphs using the ArcGIS software.	
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Additional learning material for both outcomes	To reinforce and supplement concepts to encourage further improvement and continued student success.	2019

5. Is there anything that you would like to mention that was not already captured?

I would like to thank the new lead course developer, WCC adjunct Adam Skyles, for all his help in revising and updating this course, and providing assistance in creating this assessment report, as well as helping with the proposed master syllabus changes for this course.

III. Attached Files

GLG 276 Assessment Data, Winter 2019

Faculty/Preparer:	Suzanne Albach	**Date:** 08/18/2019
Department Chair:	Suzanne Albach	**Date:** 08/18/2019
Dean:	Victor Vega	**Date:** 09/26/2019
Assessment Committee Chair:	Shawn Deron	**Date:** 11/15/2019