

## Washtenaw Community College Comprehensive Report

### GLG 276 Principles of Geographic Information Systems Effective Term: Fall 2020

#### Course Cover

**Division:** Math, Science and Engineering Tech

**Department:** Physical Sciences

**Discipline:** Geology

**Course Number:** 276

**Org Number:** 12300

**Full Course Title:** Principles of Geographic Information Systems

**Transcript Title:** Principles of GIS

**Is Consultation with other department(s) required:** No

**Publish in the Following:** College Catalog , Time Schedule , Web Page

**Reason for Submission:** Three Year Review / Assessment Report

**Change Information:**

**Consultation with all departments affected by this course is required.**

**Outcomes/Assessment**

**Other:**

**Rationale:** The purpose of this review is to update the GLG 276 master syllabus.

**Proposed Start Semester:** Spring/Summer 2020

**Course Description:** In this course, students are introduced to the basic principles and techniques of map creation and manipulation using Geographic Information Systems (GIS). Students will use ArcGIS to focus on various ways to classify, represent and visualize the Earth's surface. Upon completion of this course, students will have an understanding of basic GIS and develop fundamental skills to integrate data, draw maps, visualize trends and interpret findings.

#### Course Credit Hours

**Variable hours:** No

**Credits:** 3

**Lecture Hours: Instructor:** 45 **Student:** 45

**Lab: Instructor:** 0 **Student:** 0

**Clinical: Instructor:** 0 **Student:** 0

**Total Contact Hours: Instructor:** 45 **Student:** 45

**Repeatable for Credit:** NO

**Grading Methods:** Letter Grades

Audit

**Are lectures, labs, or clinicals offered as separate sections?:** NO (same sections)

#### College-Level Reading and Writing

College-level Reading & Writing

#### College-Level Math

Level 3

#### Requisites

#### General Education

**MACRAO**

MACRAO Science &amp; Math

**General Education Area 4 - Natural Science**

Assoc in Applied Sci - Area 4

Assoc in Science - Area 4

Assoc in Arts - Area 4

**Michigan Transfer Agreement - MTA**

MTA Science (no lab)

**Request Course Transfer****Proposed For:**

Central Michigan University  
Eastern Michigan University  
Ferris State University  
Grand Valley State University  
Jackson Community College  
Michigan State University  
Oakland University  
University of Michigan  
Wayne State University  
Western Michigan University

**Student Learning Outcomes**

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

**Assessment 1**

Assessment Tool: Module quizzes

Assessment Date: Winter 2022

Assessment Cycle: Every Three Years

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

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

**Assessment 1**

Assessment Tool: Capstone project

Assessment Date: Winter 2022

Assessment Cycle: Every Three Years

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

**Assessment 2**

Assessment Tool: Module exercises

Assessment Date: Winter 2022

Assessment Cycle: Every Three Years

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 module exercise.

Who will score and analyze the data: Departmental faculty

### **Course Objectives**

1. Explain how GIS is utilized in a variety of disciplines, such as geology and environmental sciences.
2. Explain how information in the form of maps and numbers connect to the physical world.
3. Use spatial elements, measurements, locations and references to develop graphic and numerical awareness of the real world.
4. Describe the basic procedures and the overall quality of GIS databases.
5. Demonstrate the principles of GIS as well as specialized map tools in the ArcGIS software to create a final portfolio.
6. Participate in discussions regarding the strengths and weaknesses of GIS applications.
7. Explain the importance of scale, projection, and coordinate systems in GIS.
8. Recognize both the potential and limitations of GIS software for vector applications.
9. Summarize concepts and common operations that relate to vector GIS.
10. Differentiate between spatial and attribute data.
11. Utilize vector data models, features, and topology.
12. Utilize different geographic coordinate systems, datum and map projections.
13. Apply GIS concepts and common operations to emphasize trends and patterns on the landscape for a specific vector spatial problem.
14. Use ArcGIS software and technology to represent, model and solve spatial problems in real-world applications.
15. Perform standard GIS operations, including input, editing, management, display, analysis and modeling, for the data relevant to the project.
16. Manage and link spatial and descriptive information to its geographic location.
17. Demonstrate the cartographic skills needed to generate suitable outcomes for specific problems.
18. Interpret the results obtained from the vector GIS model to create meaningful outputs for the projects.
19. Represent natural landscape components using vector features.
20. Identify and apply different ways to retrieve and to input vector data into a GIS project.
21. Select different types of vector-spatial operations and models to show patterns on the landscape.
22. Apply information, methods, and GIS models to related spatial problems.
23. Use spatial analysis techniques to combine geographic data.
24. Generate appropriate graphics and maps representing the geographic location and the tendency and patterns of the data.
25. Utilize different GIS resources available on the Internet, such as specialized data bases, remote sensing imagery, and GIS-models.
26. Relate the typical uses of GIS in business, government, and resource management.
27. Demonstrate the location, measurement and plotting (geocoding) of geographic information in relation to map coordinate systems.
28. Explain the basic cartographic concepts of scale, projections, generalization, and symbolization.
29. Prepare presentation materials, such as maps, graphs, tables, etc., using ArcGIS
30. Demonstrate the process and elements of a GIS project.

### **New Resources for Course**

#### **Course Textbooks/Resources**

##### Textbooks

Gorr, Wilpen and Kurland, Kristen. *GIS Tutorial 1 for ArcGIS Pro: A Platform Workbook*, 1 ed. Esri Press, 2017, ISBN: 9781589484665.

Bolstad, Paul. *GIS Fundamentals: A First Text on Geographic Information Systems, Sixth Edition*, 6th ed. XanEdu Publishing Inc, 2019, ISBN: 978-159399552.

Manuals  
Periodicals  
Software

### **Equipment/Facilities**

Level III classroom  
Computer workstations/lab

<b><u>Reviewer</u></b>	<b><u>Action</u></b>	<b><u>Date</u></b>
<b>Faculty Preparer:</b> <i>Suzanne Albach</i>	<i>Faculty Preparer</i>	<i>Jan 21, 2020</i>
<b>Department Chair/Area Director:</b> <i>Suzanne Albach</i>	<i>Recommend Approval</i>	<i>Jan 21, 2020</i>
<b>Dean:</b> <i>Victor Vega</i>	<i>Recommend Approval</i>	<i>Jan 23, 2020</i>
<b>Curriculum Committee Chair:</b> <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Mar 04, 2020</i>
<b>Assessment Committee Chair:</b> <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Mar 06, 2020</i>
<b>Vice President for Instruction:</b> <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Mar 06, 2020</i>

# Washtenaw Community College Comprehensive Report

## GLG 276 Principles of Geographic Information Systems Effective Term: Winter 2016

### Course Cover

**Division:** Math, Science and Engineering Tech

**Department:** Physical Sciences

**Discipline:** Geology

**Course Number:** 276

**Org Number:** 12300

**Full Course Title:** Principles of Geographic Information Systems

**Transcript Title:** Principles of GIS

**Is Consultation with other department(s) required:** No

**Publish in the Following:** College Catalog , Time Schedule , Web Page

**Reason for Submission:** Course Change

**Change Information:**

**Course description**

**Pre-requisite, co-requisite, or enrollment restrictions**

**Rationale:** We would like to drop the pre-requisites for this course (remove the pre-requisites that students must complete either GLG114 or GLG100). There should be no pre-requisites as we have found them to limit student enrollment and were not necessary for students to be successful in the course.

**Proposed Start Semester:** Winter 2016

**Course Description:** In this course, students are introduced to the basic principles and techniques of map creation and manipulation using Geographic Information Systems (GIS). Students will use ArcGIS to focus on various ways to classify, represent and visualize the Earth's surface. Upon completion of this course, students will have an understanding of basic GIS and develop fundamental skills to integrate data, draw maps, visualize trends and interpret findings.

### Course Credit Hours

**Variable hours:** No

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College-level Reading & Writing

### College-Level Math

Level 3

### Requisites

## General Education

### **MACRAO**

MACRAO Science & Math

### **General Education Area 4 - Natural Science**

Assoc in Applied Sci - Area 4

Assoc in Science - Area 4

Assoc in Arts - Area 4

### **Michigan Transfer Agreement - MTA**

MTA Science (no lab)

## Request Course Transfer

### **Proposed For:**

Central Michigan University  
Eastern Michigan University  
Ferris State University  
Grand Valley State University  
Jackson Community College  
Michigan State University  
Oakland University  
University of Michigan  
Wayne State University  
Western Michigan University

## Student Learning Outcomes

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

### **Assessment 1**

Assessment Tool: Departmental Exams

Assessment Date: Winter 2017

Assessment Cycle: Every Three Years

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

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

### **Assessment 1**

Assessment Tool: Portfolio

Assessment Date: Winter 2017

Assessment Cycle: Every Three Years

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

## Course Objectives

1. Explain how GIS is utilized in a variety of disciplines, such as geology and environmental sciences.
2. Explain how information in the form of maps and numbers connect to the physical world.
3. Use spatial elements, measurements, locations and references to develop graphic and numerical awareness of the real world.
4. Describe the basic procedures and the overall quality of GIS databases.
5. Demonstrate the principles of GIS as well as specialized map tools in the ArcGIS software to create a final portfolio.
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25. Utilize different GIS resources available on the Internet, such as specialized data bases, remote sensing imagery, and GIS-models.
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28. Explain the basic cartographic concepts of scale, projections, generalization, and symbolization.
29. Prepare presentation materials, such as maps, graphs, tables, etc., using ArcGIS
30. Demonstrate the process and elements of a GIS project.

## **New Resources for Course**

### **Course Textbooks/Resources**

#### Textbooks

Price, M.. *Mastering ArcGIS (w/Video Clips DVD-ROM)* , 5 ed. McGraw Hill, 2012, ISBN: 9780077462956.

#### Manuals

#### Periodicals

#### Software

### **Equipment/Facilities**

Level III classroom

Computer workstations/lab

<b><u>Reviewer</u></b>	<b><u>Action</u></b>	<b><u>Date</u></b>
<b>Faculty Preparer:</b> <i>Suzanne Albach</i>	<i>Faculty Preparer</i>	<i>Jul 31, 2015</i>
<b>Department Chair/Area Director:</b> <i>Kathleen Butcher</i>	<i>Recommend Approval</i>	<i>Sep 01, 2015</i>
<b>Dean:</b> <i>Kristin Good</i>	<i>Recommend Approval</i>	<i>Sep 02, 2015</i>
<b>Curriculum Committee Chair:</b> <i>Kelley Gottschang</i>	<i>Recommend Approval</i>	<i>Oct 01, 2015</i>
<b>Assessment Committee Chair:</b> <i>Michelle Garey</i>	<i>Recommend Approval</i>	<i>Oct 11, 2015</i>
<b>Vice President for Instruction:</b> <i>Michael Nealon</i>	<i>Approve</i>	<i>Nov 02, 2015</i>