

# Geography 433: Geodesign for Sustainability and Resiliency

## Fall 2022 (Section 1)

<b>Instructor:</b>	Douglas Miskowiak, Senior GIS Education Specialist
<b>Course Dates/Times:</b>	Tuesday and Thursday, 2:00 pm to 3:50 pm in Science B308
<b>Office Hours:</b>	Tuesday 10-11 am. Please email me to schedule office hours by appointment
<b>Office Number:</b>	Science B-305
<b>Phone &amp; e-mail:</b>	(715) 346-4789 <a href="mailto:dmiskowi@uwsp.edu">dmiskowi@uwsp.edu</a>

## Course Overview

This course applies Geodesign frameworks and methods to develop and communicate sustainable and resilient community solutions. The course is segmented into three parts.

Part 1 establishes the **FOUNDATIONS AND CONTEXTS** for Geodesign and Geographic Information Systems for addressing issues in sustainability and resiliency. Students will develop a language for communicating Geodesign frameworks.

Part 2 applies a **GEODESIGN FRAMEWORK FOR DESIGNING THE METHODOLOGIES**. The Steinitz framework will first be applied to quickly scope out a Geodesign project. Once the issues of the project area are better understood, the Geodesign Team will learn to apply the framework to design the project methods for each set of Geodesign models (DECISION-IMPACT-CHANGE-EVALUATION-PROCESS-REPRESENTATION).

In Part 3 you will apply a Geodesign Framework and GIS techniques to **IMPLEMENT THE GEODESIGN STUDY**. Various case studies will continue to be shared, but the majority of the time you will work in the Geodesign Studio to work on your final project, starting with Representation Models and Ending with Decision Models.

## Target Audience

This course is intended for students interested in applying Geographic Information Systems and a Geodesign approach toward S/R planning. This course is applicable to those seeking careers in GIS, planning, conservation, sustainability, resiliency, land trusts, and environmental consulting.

## Learning Outcomes

After taking this course, students will be able to:

- Apply a planning/design framework to consider complex Geodesign projects.
- Apply various measurement formats to analyze and evaluate S/R success or failure.
- Consider human interests in arriving at decisions.
- Apply GIS techniques to create a S/R plan.
- Communicate S/R solutions to professionals and members of the public.

## Course Format

This course is conducted synchronously (in real-time) in a face-to-face format. Attendance and active student engagement are mandatory. A portion of your grade is based upon attendance and participation.

Course content is delivered using a combination of lectures, discussions, and studio exercises. At the instructor's discretion, course materials may be made available on the UWSP internet portal, Canvas. Canvas may also be used disseminate grades and to conduct some learning assessments. **Contact your instructor if you need assistance logging in to Canvas.**

This course consists of:

1. Lectures and Discussions
2. Attendance and Participation
3. Online Learning Resources
4. Provided Book "A Framework for Geodesign"
5. Geodesign Studio Exercises
6. Final Geodesign Project

### 1. Lectures and Discussions

Lectures will cover a range of materials from Geodesign frameworks, Geodesign methods, using GIS to fulfill Geodesign requirements. Various case studies will also be shared in a lecture format.

The Geodesign Team will engage in regular discussions concerning lecture topics and project design. Students are expected to lead discussions. Discussion leaders are expected to fully and completely engage with course materials prior to the discussion, summarize lessons, and lead discussion. All students are required to participate in discussions, including reading or viewing all content and sharing in discussion.

The Geodesign Principal will facilitate project design discussions. Geodesign Team members will be required to actively participate in the project design discussions. Students will be required to take their own notes during project design discussions. The majority of course participation points are awarded by participation in discussion. Some lecture periods students will explore readings and then discuss the readings in the classroom. During discussions, the instructor intends to work as a facilitator and moderator. It is expected that students take the lead role in discussion.

### 2. Attendance and Participation

Attendance will be managed per the UWSP attendance policy. Attendance in the classroom is mandatory. Professionally/academically related participation and engagement among students and between students and the instructor is an important part of the human learning experience. If you are unable to attend scheduled class, you are expected to engage with your peers and instructor in some other meaningful way. Much of this class is group work – please be accountable to your peers. Simple

attendance is worth 100 course points toward your final grade. Students who fail to attend on a regular basis (miss 5 or more sessions) **will lose all attendance points.**

Active and meaningful participation in the classroom is worth another 100 course points. Your participation will be evaluated in the following ways:

- A. Active participation: Are you actively and regularly participating in the discussions and Geodesign studio? Students who ask questions and engage in course discussions are considered active participants.
- B. Meaningful participation: Asking trite questions and speaking just to speak is not meaningful participation. Students who engage with course materials and engage based on knowledge of course materials and who advance the Geodesign process will be considered meaningful participants.

## **Geodesign Team Format**

The Geodesign Team Format engages professionals from the design professions, geographic sciences and information sciences, as well as community stakeholders, including the general public. The Geodesign Team works together utilizing the strengths of each team member and the values and preferences from the stakeholders to design solutions. This course will emulate the Geodesign Team Format. For this class the teams will consist of:

**Geodesign Principal:** The course instructor will perform in the capacity of the Geodesign Principal. The Geodesign Principal oversees the entirety of operations and is responsible for setting organizational directions and providing support to Geodesign Team members.

**Project Managers:** Students at the graduate level will perform in the capacity of Project Managers. They are expected to be responsible to lead small teams to work on Geodesign projects. They will provide leadership and support to their team and they will work with the principal and other project managers to pollinate ideas and mature Geodesign concepts for implementation.

**Geodesign Associates:** Students at the undergraduate level will perform in the capacity as Geodesign Associates. They will bring a variety of professional skills to each team. Teams will be organized based upon individual levels of expertise in design, sciences, and information sciences. Students will, however, need to participate on all aspects of Geodesign problem solving, even those areas outside their present professional area.

**Community Stakeholders:** Periodically community stakeholders and clients will (may) be invited to the Geodesign Studio to share their values and preferences for the design solution. The Geodesign Team is expected to ask a range of questions to help inform the design process.

**Subject Experts:** Often the Geodesign Team, including the Principal will not be in a position to provide subject area expertise. The Geodesign Team is responsible for contacting subject experts to obtain their testimony and acquire their knowledge. Literature searches, conducted by the Geodesign Team, are a significant component of the Geodesign approach.

### 3. Online Learning Resources

Readings and other learning resources are made available to students via Canvas. These resources will be organized by lecture topic. No book purchase or rental is required for this course.

### 4. Provided Book: “A Framework for Geodesign”

The book, *A Framework for Geodesign*, by Carl Steinitz will be provided at the beginning of the semester. The book must be returned to the professor at the end of the semester. Students who do not return the book will receive an INCOMPLETE until the book has been returned. The course uses the Steinitz Geodesign method that is widely used around the world to conduct planning work. This book provides guidance on his method.

### 5. Geodesign Studio Exercises

Learners will complete nine Geodesign projects throughout the semester all in preparation for the final Geodesign project, report, and presentation. Students should consider a final project that they have an interest in working on. If a final project theme has not been introduced by the Geodesign Principal, Geodesign Team members should propose one to the Geodesign principal prior to part 2 of this course. Projects are worth between 25 and 100 points for a total of 450 points. Each Geodesign team member will complete each exercise individually, but is expected to consult the Geodesign team on a regular basis for ideas and critique. Students will have the opportunity to share projects for critique among the team, managers, and principal prior to turning them in for a final grade. The principal will issue the final grade based on a rubric. Assessments include:

1. Create a story map
2. Create an operations dashboard
3. Scope out the Geodesign study
4. Design the Decision Models – Conduct a Stakeholder Assessment
5. Design the Impact Models – Select the metrics and performance indicators
6. Design the Change Models – Select and design the means to change existing conditions
7. Design the Evaluation Models – Assess the existing conditions of the project area
8. Design the Process Models – Determine which functions/systems are important
9. Design the Representation Models – Determine which data, and what scale, are necessary to fulfill the project.

#### **Expectations**

1. **Exercises:** Project descriptions and rubrics will be handed out to the Geodesign Team.
2. **Supplemental Resources:** There are no explicit instructions for Geodesign Projects. You are expected to apply skills gleaned from previous GIS coursework and research new skills from other resources, including using the Geodesign Team and literature searches.

3. **Due Dates:** Two due dates are offered for exercises 3-9. The first due date represents when a project must be ready for presentation and critique by the Geodesign Team. The second due date represents when the project is due to the principal for grading. If a project is not ready for critique by the Geodesign Team a deduction of 10% will be assessed. Projects turned in late to the Principal will be deducted 25% for each day after the second due date.
4. **Geodesign Team Critique:** By the first due date you should be ready to share your project with the Geodesign Team for critique. Please present your work using the rubric as a guide. The Geodesign Team should be ready to offer advice for improvement.
5. **Grading Rubrics:** Rubrics are explicitly outlined with each exercise handout.
6. **Class Server:** Data, projects, and completed exercises are stored in a student class server subdirectory. Each student has a subdirectory located within the following server location (**z:\\uwsp.edu\\files\\CLS\\GEO\\classes2**). All Geodesign Projects should be saved to your folder workspaces. You are responsible for collecting, creating and managing data, projects and outputs in your workspaces.
7. **Computing and Software Requirements:** Exercises require the use of campus computers and ArcGIS Pro 3.x. Learners are expected to have a working knowledge of Windows 10. Moreover, students are expected to have a solid understanding of GIS database editing, analysis, and map making with ArcGIS. ArcGIS software is available in all general-purpose campus labs.

## 6. Final Geodesign Project

In Part 3 of the course, the Geodesign Team will implement their design methods starting with the representation models and ending with the decision models. 350 course points are awarded for perfect implementation of the Geodesign framework.

1. Representation Models – Collect the appropriate data to implement the study.
2. Process Models – Conduct analyses that indicate how the project area functions.
3. Evaluation Models – Indicate how well the project area is functioning in its present condition.
4. Change Models – Implement models that determine how the project area should change to function more sustainably and resiliently.
5. Impact Models – Showcase the metrics that indicate improvement.
6. Decision Models – Create a presentation for the decision-makers that share your methodology and persuade them to act.

Geodesign Projects will be evaluated for: (consult individual rubrics for more information).

- Program research and design
- Database management
- Valid analytical techniques and outputs
- Communication elegance and effectiveness

## Evaluation and Grading

Class Attendance	= 100
Class Participation	= 100
Geodesign Studio Exercises	= 450
Final Geodesign Project	= 350
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Total	1000 Points

Ranges of percentages, course points and their equivalent letter grades are shown below. By referring to this table you can determine your letter-grade standing at any point in the course.

<u>Percent</u>	<u>100 Points</u>	<u>50 Points</u>	<u>Course Pts.</u>	<u>Letter Grade</u>
93-100	93.0	46.5	930	A
90	90	45	900	A-
87	87	43.5	870	B+
83	83	41.5	830	B
80	80	40	800	B-
77	77	38.5	770	C+
73	73	36.5	730	C
70	70	35	700	C-
67	67	33.5	670	D+
63	63	31.5	630	D
<63	<63	<31.5	<630	F