

George Mason University
Department of Geography & Geoinformation Science

GG5 507-001: Geographic Approaches for Sustainable Development Fall 2024

Contact Details for Your Instructor		Course Details	
Name	: Maction Komwa, PhD	Class Meeting Times	R 4:30 pm – 7:10 pm
Office	: Exploratory Hall, Room 2414	Location	Thompson Hall 1017
Email	: mkomwa@gmu.edu	Credit hours	3.00
Phone	: 703-993-5646	Office Hours	W: 10:30 am -11:30 am R 1:30 pm – 2:30 pm

Graduate Teaching Assistant

Name : Zheng Gong
Email : zgong@gmu.edu
Office Hours: T: 1PM-3PM | R: 1PM-3PM

Course Description:

Sustainability lies at the intersection of the environment, society, and economics. This course explores the concepts of sustainable development at different geographical scales (local, national, and international). We examine the applications, indicators, measurement tools of sustainable development for analysis and decision making in support of environmentally sustainable development from a geographic perspective. Case studies and problem-solving exercises will be used to stimulate learning and provide practical experience in addressing sustainable development issues.

Required Textbooks:

Exploring Sustainable Development: Geographical Perspectives. *Edited by Martin Purvis and Alan Grainger.*

Learning Outcomes

Upon completing this course, students will be able to:

- Identify and analyze the interconnected social, environmental, and economic dimensions of sustainability.
- Integrate social and environmental data to understand the spatial patterns and impacts of sustainability issues.
- Critically analyze various approaches to sustainable development, including the UN Sustainable Development Goals, and assess their effectiveness in addressing global challenges.
- Communicate effectively on sustainable development issues by articulating their understanding of sustainable development concepts and apply their knowledge to real-world problems through written and oral presentations.

Learning Management Systems [LMS]

- Canvas is our course learning management system (LMS). It provides access to course materials, assignments, and class discussions. You will log in to Canvas using your George Mason username and password through this link: <https://canvas.gmu.edu/>
- To get started with Canvas, check Canvas LMS Transition website: <https://lms.gmu.edu/getting-started-students/>
- If you have computer problems, please contact ITS Support Center_ <http://itservices.gmu.edu>; Email: support@gmu.edu; | Phone: 703-993-8870.

Assignments and Evaluation

Students are expected to submit high quality assignments during this course via the Canvas. All assignments are to be completed according the dates outlined in the syllabus.

Course Assignment Requirements Description	Allocated Percentage
Discussion Forum Simulation Activities Class debate	5%
Reading Reflection Summaries	5%
GIS for Sustainable Development Labs Experiential Learning Activities (ELA)	18%
Exam 1	15%
Exam 2	20%
Final Research Paper [Individual] <ul style="list-style-type: none"> Topic description (No grade), Annotated Bibliography (1%), Draft (2%), Peer-Review 2%;Research Paper (20%) 	25%
Final Presentation	10%
Discussion Leader	2%

Grading Scale

Students will receive grades according to the scale detailed below:

Range	Letter Grade	Grade description	Range	Letter Grade	Grade description
>=93	A	Excellent	77 - 79.9	C+	Above satisfactory
90 – 92.9	A-	Very Good	70 - 76.9	C	Satisfactory
87 - 89.9	B+	Good with merit	60 - 69.9	D	Just OK
83 - 86.9	B	Good	<60	F	Fail
80 - 82.9	B-	Above satisfactory			

Final Research Paper [See Scaffolded Assignments in the Description Table above]

Purpose: This research paper will provide you with an opportunity to investigate deeply into a sustainability-related topic and apply the knowledge gained throughout the course. By conducting thorough research and linking class concepts to real-world issues, you will enhance your understanding of sustainable development.

Topic Selection

Choose a topic aligned with sustainability from the suggested list or any topic that you may be interested in, as long as it is relevant to the concepts learned in this course.

- Renewable Energy and the Sustainable Campus
- Reduce, Reuse, Recycle
- Sustainable Waste Management
- Sustainable Cities
- Sustainable Business
- Climate Change
- Food Systems
- Life Cycle Assessment
- The application of geospatial technology to sustainable development

Paper Requirements:

- **Length:** Approximately 15 pages (excluding title page and references)
- **Formatting:** Adhere to the style guide specified by your instructor (e.g., APA, MLA)
- **Structure:** Include a clear introduction, body paragraphs, and a conclusion. Full instructions will be posted in appropriate folder in Canvas
- **Research:** Cite credible sources to support your arguments.
- **Originality:** Demonstrate your understanding of the topic and avoid plagiarism.

Discussion Forum

Class discussion is an important part of any college experience. During the next scheduled 8-weeks, I will ask students to read a course related article or a section within a chapter that provokes a class discussion. The following tasks will be followed for students to participate and get credit.

Task 1

Students will be required to post to the online discussion forum with your own thought-provoking comments to the article or assigned section along with an interpretive response reflecting your own understanding about the topic.

Task 2

Students must then read and respond to at least two other students' posting and offer evidence that supports or challenges the other students' interpretation. If a challenge is initiated then the student is asked to respond trying to either refute the challenge, or provide additional information or concede by explaining why.

Absolutely, no make-up will be given for Discussion Forum. Your postings will be evaluated according to the scientific content, critical thinking and concept application based on the following criteria:

- *Unacceptable (0 points); poor (1 point); good (3 points) and excellent (5 points). For a full rubric, check the Canvas.*
- *Each Discussion topic will have instructions or a thread on how to write and submit the posting and your response.*

Exams

- There will be three Exams: Exam 1, 2 (for both Undergraduate and Graduate Students) and Final Exam for GGS 307 Students Only. Each exam will contain objective (multiple-choice) and short-answer questions, Fill-in the blank questions. A Review Session will be done a week prior to Exam. Please take notes during our lectures.

Reading Reflection

The material covered each week is outlined on the course calendar (Canvas or in the syllabus). I expect you to read the relevant parts of the assigned topics/chapter and other articles prior to class so that you can participate in class discussion and to reflect metacognitively on what you have read and absorb information by describing the following:

1. Most important concepts issues, factual information from the reading and justify your choices **(4 points)**
2. Identify some aspects of the reading you don't understand and briefly discuss why these are confusing elements of the topic/reading **(4 points)**
3. Pose a question to the reading – what is your curiosity about the topic, concept(s) from the readings? **(2 points)**

Your reading will be completed in advance before class meeting. Assessment of this assignment will be as follows:

- 10 points full credit for doing a great job (summary of ~250 words) turning on time, and demonstrating some actual reflection
- 5 points if the assignment is late, short, incomplete or lacks reflection
- 0 points are awarded for no show/submission

In your assignments, I expect you to cite all sources using APA-format. We will have a session on how to correctly use APA-format. I encourage you all to attend a library orientation, which will assist you if you are unsure of literature citation standards. In the academia, it is very important for you to remember that at the end of every writing assignment or presentation you include a complete reference list.

GIS Lab Assignments

- Many of the sustainability issues we'll discuss in this course can be analyzed and mapped within a geographic context. This provides an integrative framework for policymakers to make informed decisions about sustainable development at local, national, and global levels.
- As outlined in the learning outcomes, organizing sustainability-related knowledge, data, and

information into a coherent framework is essential for effective decision-making and sustainable development.

- Through GIS lab assignments, you will develop specialized skills aimed at mapping a better future for people, prosperity, and the planet.
- **GIS lab instructions will be posted in the Assignments folder.** Recorded hands-on activities will be posted on Canvas by the GTA.

Late/Make-up work policy

Due Dates: All assignment due dates are clearly marked in the syllabus and on Canvas.

Flex Days [“Life Happens Pass”]

- You have 2 "flex days" to use throughout the semester. These allow you to submit an assignment up to 48 hours late (without penalty) for any reason (except online discussions).

Late Penalties:

- After using your flex days, late assignments will be penalized:
 - **1st day late:** 90% credit
 - **Each additional day late:** 5% credit deducted (until no points remain)

Extenuating Circumstances: If you have a serious reason for missing a deadline (medical emergency, etc.), contact the instructor as soon as possible.

COURSE COMMUNICATION

Announcements

Announcements will be posted in Canvas on a regular basis. They will appear on your Canvas Home Page Announcement or they will be sent to you directly to your GMU Account. Please make certain to check them regularly, as they will contain any important information about upcoming projects or class concerns. I will not be able to reply to your emails instantly, however, I should be able to respond within 24-48 hours. Sending messages over the weekend might take a bit longer for you to get a reply.

EMAIL

In this course we will use the GMU email account for specific private messages to your Instructor. For any general questions about assignment or if you come across an interesting that they you would like to share with the rest of the class, use the *Discussion Forum under Ask your Instructor/Question Forum* thread. Your question(s) can benefit other students or some students may know the answer.

When submitting messages, please do the following:

- Put a subject in the subject box that describes the email content with your name, week and message subject. For example: YOURNAMEWK2ASSIGNMENT.
- Do not send messages to my email asking general information about the class, please post those in the QUESTION FORUM – Ask your Instructor/GTA
- Make certain to check your messages frequently

Student Expectations:

- **Active Engagement:** Stay actively engaged with course materials, discussions, and deadlines.
- **Respectful Participation:** Respect the contributions and perspectives of your classmates, and express our opinions courteously.
- **Open-Mindedness:** Value and learn from diverse perspectives, fostering a respectful and inclusive learning environment.
- **Effective Communication:** Communicate clearly and professionally in both written and oral assignments.

Academic integrity:

- *The following statement is adapted from the Stearns Center for Teaching and Learning.* No grade is important enough to justify academic misconduct. The integrity of the University community is affected by

the individual choices made by each of us. Mason has an Honor Code, which you can read fully at the Office for Academic Integrity (<https://oai.gmu.edu/mason-honor-code/>). The Honor Code Pledge reads as follows:

- *To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University Community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set for this Honor Code: Student Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.*
- It is expected that you understand these definitions. If you have any doubts about what constitutes cheating, plagiarism, stealing, or lying in the academic context, please see your professor. *Acts of academic dishonesty in this course may be penalized with failure of either the work in question or the entire course.*

Students with Disabilities

Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993- 2474.

Diversity and Inclusion

George Mason University is committed to providing equal opportunity and an educational and work environment free from any discrimination on the basis of gender expression and identity, race, economic status, sex, sexuality, ethnicity, national origin, first language, religion, age and ability, marital status, pregnancy status, or genetic information. George Mason University shall adhere to all applicable state and federal equal opportunity/affirmative action statutes and regulations.

If you wish, please share your preferred name, gender pronouns, and how you would like to be addressed in class via email or through the self-intro assignment posted through the Canvas. For reference, I use he/him pronouns. If you are in transition of changing your name and gender pronouns, please keep me posted during the semester so that I can address you accordingly.

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking

As a faculty member, I am designated as a “Responsible Employee,” and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s Title IX Coordinator per University Policy 1412. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (703-380-1434) or Counseling and Psychological Services (CAPS) (703-993-2380). You may also seek assistance from Mason’s Title IX Coordinator by calling 703-993-8730 or emailing cde@gmu.edu.

Recording and/or sharing class materials

Electronic video, image capture, and/or audio recording is not permitted during in-class meeting unless the student obtains permission from the instructor.

As a faculty member who will spend a lot of time creating course material for classroom use, unauthorized sharing of any of my course materials outside the class would violate important ethical standards including the Mason Honor code

Student Support Services

George Mason University has several academic support and other resources to facilitate your success. Some of these resources are presented below:

- i. Counseling and Psychological Services: <http://caps.gmu.edu/>
- ii. Learning Services, University Career Services: <http://careers.gmu.edu/>
- iii. The Writing Center <http://writingcenter.gmu.edu/>
- iv. University Catalog: <http://catalog.gmu.edu/>

- v. University Policies: <http://universitypolicy.gmu.edu>

Absences & Accommodations

- **Religious Holidays:** Please refer to George Mason University's calendar of religious holidays and observations (<http://ulife.gmu.edu/calendar/religious-holiday-calendar/>). It is the student's responsibility to speak to the instructor in advance should their religious observances impact their participation in class activities and assignments.
- **Absence for documented illness:** Students who miss multiple virtual classes due to prolonged illness should seek medical care and provide documentation of such to the Dean's Office, which will communicate with the student's professor(s). A prolonged absence may necessitate the student's withdrawal from the course or from the University for the semester.
- **At the discretion of the professor:** There may be cases where an absence is undocumented but is, nevertheless, excused by the professor (e.g., absence due to a death in the family). Students should initiate a conversation with their professors about the nature and duration of the absence, in advance of the absence whenever possible.

When absences are excused, students remain responsible for all assigned work, and shall be provided with the opportunity to make up, without penalty, any work that they have missed.

Overview of the Semester

An outline of the topics covered each week see the table below:

Week In-class Meeting		Topic description	Readings	Assignment short description and due date
1	8/29	Course Overview	Syllabus	Online Discussion - Self-introduction
		An Introduction to Sustainability	Chapter 1	
2	9/5	What is Sustainable development?	Chapter 1	Online Discussion 1: - Initial Post due Thursday - Comments due Sunday
		<ul style="list-style-type: none"> ○ Economic Growth and Progress: How economic development contributes to sustainability. ○ Pillars of Sustainability: The three main parts of sustainability: economy, environment, and society. ○ Sustainable Development Timeline: A history of sustainable development ideas. ○ MDGs to SDGs: The shift from the Millennium Development Goals to the Sustainable Development Goals and the goal of a sustainable world by 2030. 	<i>Mapping the Sustainable Development Goals Relationships [Check Article on Canvas]</i>	
3	9/12	Sustainable Development and Geospatial Information Geospatial Information and Its Applications <ul style="list-style-type: none"> ○ What is geospatial information? ○ Types of geospatial data ○ Applications of geospatial information in sustainable development ○ Geospatial Information as a Decision-Making Tool ○ Emerging Technologies and Their Implications ○ Remote sensing ○ Geographic Information Systems (GIS) ○ Global Positioning Systems (GPS) 	Chapter 3	<i>GIS Application — [Introduction to ArcGIS Pro]</i> <i>Submit a tentative research topic</i>
4	9/19	Measuring Sustainability <ul style="list-style-type: none"> ○ Tools and Systems: Exploring methods and frameworks for measuring sustainability and how they differ across the globe. ○ Geography and Sustainable Development: Examining the relationship between geography and sustainable development. 	Chapters 2 Check additional reading materials on Canvas <i>Intro: Mapping the Sustainable Development Goals – GIS hands-on class activity ELA [Poverty Indicators]</i>	Online Discussion 2: - Initial Post due Thursday - Comments due Sunday <i>Discussion Leader(s) – Check the Roster on Canvas</i> Reading Reflection #1 – See full details on Canvas

5	9/26	Exam 1	GIS Hands-on Activity on Poverty Mapping	Exam 1
6	10/3	<p>Life Cycle Assessment and Circular Economy: A Synergistic Approach</p> <p>Unit 1.1: Introduction to Life Cycle Assessment (LCA)</p> <ul style="list-style-type: none"> • Stages of LCA • Importance of LCA <p>Unit 1.2: Circular Economy Principles</p> <p>Key Principles of Circular Economy</p>	<p><i>Check Additional Articles and Videos through the Canvas</i></p> <p>Case Studies</p> <ul style="list-style-type: none"> • Case Study 1: LCA of a product in a circular economy context • Case Study 2: A successful circular economy initiative integrated with LCA 	<p>Discussion Leader(s): Please refer to the course roster on Canvas for a list of potential discussion leaders.</p> <p>Reading Reflection #2 – Full details on Canvas</p> <p>Submit your Annotated Bibliography</p>
7	10/10	<p>Sustainable Agriculture for the 21st Century</p> <ul style="list-style-type: none"> ○ Modern Agriculture: Examining contemporary agricultural practices. ○ Sustainable Farming Systems: Different Places, Different Solutions: Exploring diverse approaches to sustainable farming adapted to various regions. ○ How Food Systems Threaten the Environment: Investigating the environmental impacts of current food production systems. 	<p>Chapter 8</p> <p><i>Check Additional Articles and Videos through the Canvas</i></p> <p>Guest Speaker</p>	<p><i>GIS Application - Poverty Mapping (Indicators) – Form a group and pick a suggested topic from the instructor</i></p>
8	10/17	<p>Urban Sprawl and Sustainable Cities</p> <ul style="list-style-type: none"> ○ Making Cities More Sustainable: <ul style="list-style-type: none"> ○ Strategies for creating sustainable cities, including people-centered planning and community involvement. ○ What Makes a City Sustainable? <ul style="list-style-type: none"> ○ Key factors that contribute to a city's sustainability. ○ New Sustainable Communities: <ul style="list-style-type: none"> ○ Examples of communities built using sustainable principles. ○ Case Studies on Sustainable Cities: <ul style="list-style-type: none"> ○ In-depth looks at sustainable cities, such as Curitiba (Brazil) and Amsterdam (Netherlands), with a focus on sustainable transportation. 	<p>Chapters 6</p> <p><i>Check Additional Articles and Videos through the Canvas</i></p>	<p>Online Discussion 3:</p> <ul style="list-style-type: none"> - Initial Post due Thursday - Comments due Sunday <p>Discussion Leader(s) – Check the Roster on Canvas</p>
9	10/24	Exam 2	GIS Hands-on Activity on SDGs (Climate Change Indicators)	Exam 2

10	10/31	<p>Climate Change, Energy, and Sustainability</p> <ul style="list-style-type: none"> ○ Climate Science: Understanding how climate change works. ○ Climate Threats: How climate change harms sustainability. ○ Adapting to Climate: Preparing for climate changes. ○ Reducing Emissions: Stopping climate change. ○ Planet Limits: Knowing how much Earth can take. ○ Clean Energy: Using renewable energy for a healthier planet. ○ Energy, Pollution, and Health: How energy affects our health and the environment. 	Chapter 11	<p><i>Discussion Leader(s) – Check the Roster on Canvas</i></p> <p>Reading Reflection #3 – See full details on Canvas</p> <p>Submit your Draft</p>
11	11/7	<i>Climate Change Simulation Activity - ELA</i>	<i>Guest Speaker on Climate Change</i>	<p>Online Discussion 4:</p> <ul style="list-style-type: none"> - Initial Post due Thursday - Comments due Sunday <p><i>Discussion Leader(s) – Check the Roster on Canvas</i></p> <p>Submit your Climate Mapping Assignment – Submit an outline of your presentation</p>
12	11/14	<p>Biodiversity and Sustainability</p> <ul style="list-style-type: none"> ○ What is Biodiversity? All the different kinds of life on Earth. ○ Why Biodiversity Matters: Biodiversity is important for a healthy planet. ○ Threats to Biodiversity: Things that harm biodiversity. ○ GIS Activity: Using maps to study climate change and its impact on biodiversity. ○ Future Perspectives: Developing Sustainable Development 	<p><i>GIS Hands-on Activity: Mapping Biodiversity & Invasive Species</i></p> <p><i>Check Additional Articles and Videos on Canvas</i></p> <p><i>Chapter 13</i></p>	<p>Reading Reflection #4 – See full details on Canvas</p> <p>Submit your Peer-Review</p>
13	11/21	Final Presentation -1		<p>Submit your PowerPoint Presentation [No Google ppt]</p> <p>Submit your Biodiversity Indicators Map Assignment</p>
14	11/28	Thanksgiving – No Classes		Nothing is due – Enjoy your Thanksgiving
15	12/5	Final Presentation -2		Submit your PowerPoint Presentation [No Google ppt]
16	12/8	Final Paper due		

Faculty reserves the right to alter the schedule as necessary, with notification to students.