

Dedicated Courses that Address Sustainability and the SDGs at Ashesi

Ashesi University has decided to approach climate and sustainability education in three (3) ways to develop climate-smart mindsets among its students.

First, it has embedded climate change and sustainability education in every Ashesi syllabus. Ashesi offers a liberal arts foundation and three (3) major degrees: Business Administration, Computer Science and Information Systems and Engineering. The programs' course content span all 17 SDGs. Faculty across the departments have begun to integrate climate smart thinking in their class exercises, for example: in the *Introduction to Computing and Information Systems* course, the following activity which covers SDG 4, 9 and 13

CS 111 – Introduction to Computing and Information Systems
(for first year students – all CS, MIS and BA majors in the class of 2026)

The Introduction to Computing and Information Systems class had a teamwork activity with the following learning objectives:

1. Describe the difference between weather and climate
2. Explain some of the challenges in making climate change predictions
3. Utilize Python functions, including parameters and return values.
4. Design and implement a Python conditional statement based upon climate science.

Students were required to watch a short video on climate change, as well as read through and complete a scaffolded activity. The activity introduced learners to concepts such as weather, climate, and climate change while practicing computer programming concepts such as functions and conditional statements. Learners were also introduced to simple algorithms to predict the increase in temperature over a given baseline level.

Another example in a Math class activity which covers SDG 4, 7, 9 and 11.

MATH 121 – Pre-Calculus 1
(for first year students – a subset of CS, MIS and BA majors in the class of 2026)

A data analysis project was piloted for one section of Precalculus 1. The project used CO2 emissions data for Ghana from 1980 to 2021. Students developed and interpreted exponential growth models to compare the rate of growth in CO2 emissions from oil, gas, cement production, and flaring over the period. They presented their results in the form of a 2-page consultants report, with an introduction, summary of the analysis, including data visualization, and conclusion.

Second, Ashesi is implementing a hidden curriculum by modelling sustainability behaviors such as harvesting rainwater, recycling wastewater, increasing its use of solar energy, encouraging students to use recyclable tote bags instead of plastic bags, etc.

Third, Ashesi is introducing two climate change and sustainable education electives, namely Climate Change and Global Innovation and Sustainability and Systems Thinking whose syllabi can be seen below

Syllabus for the course:

Climate Change and Global Innovation



Climate Change and Global Innovation – Section A

1. GENERAL INFORMATION

Course Code and Name: Climate Change and Global Innovation
Year / Semester: 2023–2024 / Semester One (Fall)
Course Content Available On: CANVAS – <https://ashesi.instructure.com/login/canvas>

Instructors

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Phone: +233 555175013	Phone:
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Office Hours:	Office Hours:

Faculty Interns

Name:	Name:
Office:	Office:
Phone:	Phone:
Email:	Email:
Office Hours:	Office Hours

Times (TBD)

Location (TBD)

Lectures	Tuesdays 08:00–09:30 AM GMT	PNRB 100
	Thursdays 08:00–09:30 AM GMT	PNRB 100
Tutorials	Fridays 13:50–15:20 PM GMT	PNRB 100

2. COURSE DESCRIPTION

This course examines the origins and effects of climate change. It investigates how past and present climate changes can be observed to have social, economic, and political effects that technological developments have not erased, and may even have aggravated. The implications of model-based forecasts of the expanded greenhouse effect for Africa and other parts of the world will be examined, as will alternatives for mitigating and adapting to future global climate change. Climate change is discussed with critical awareness around innovative thinking and problem solving towards clean energy, sustainable engineering and smart earth systems; there will be innovation case readings and discussions in class. Innovation has been used by humans through ages to cope with changes and discover new opportunities. This course explores innovation as a vehicle to foster competitive advantage and sustained growth. Global climate innovation efforts would be examined. Applied to address climate change, technological innovation is expected to deliver transformative climate solutions.

Required of _____

Prerequisite(s):

3. COURSE OBJECTIVES (Student Learning Outcomes)

At the end of the course, the student will be able to:

1. Explain the science of climate change and critically assess relevant scientific literature to produce new and informed insights.
2. Explain the mechanisms that generate climate variability, as well as the role of human action in altering the current and future trajectory of global climate.
3. Explain the basis for quantifying and measuring historical and future climate change, as well as the uncertainties involved with future climate modelling and how to factor these uncertainties in decision making.
4. Recognise the impacts which may be anticipated at different spatial scales (globally, regionally and in Ghana) caused by climate change and be aware of national and international commitments which will guide Ghanaian policy in this area in the years ahead.
5. Evaluate potential solutions to decarbonise our economies and critically scrutinise and reflect on social norms with respect to climate change mitigation and adaptation.
6. Examine global initiatives and efforts toward innovations in climate change adaptation and mitigation.

4. ASHESI LEARNING GOALS ADRESSED IN THIS COURSE

- **Ethics and Civic Engagement:** Students will be introduced to ethical considerations around environmental sustainability, including climate justice, responsible consumption and care for unborn generation.
- **Critical Thinking and Quantitative Reasoning:** The course allows for the application of critical thinking, persuasion, and presentation skills; critical reasoning around sustainable futures. Treatment of climate data analytics topics will foster quantitative reasoning.
- **Leadership and Teamwork:** Through team projects and in-class discussions, students will develop interpersonal skills required to work with people in producing results. Students will acquire critical awareness of climate leadership.
- **Communication:** The course contributes to student's written communication development through critical writing assignments. Opportunities for articulative expressions via group discussions and presentations will be explored in class.
- **Technological Competence:** computer applications in climate modelling and digital information literacies around sources of climate change data are explored in class.

5. PRIMARY TEXTBOOKS/SECONDARY READINGS

Primary Reading:

1. Goosse H. (2015). *Climate System Dynamics and Climate Modeling*. Cambridge Press
2. Maslin M. (2021) *Climate change: a very short introduction* (4th. ed)
3. John C. Mutter(2020). *Climate Change Science*; Columbia University Press [Climate Change Science | Columbia University Press](#)

4. Bulkeley H., Newell P.(2015). *Governing Climate Change* Routledge <https://doi.org/10.4324/9781315758237>
5. Suraj Mal, R.B Singh, Christian Huggel (2018) *Climate Change, Extreme Events and Disaster Risk Reduction*. Springer [430662_1 En BookFrontmatter 1..17 \(springer.com\)](#)
6. Wang Q. (2019) Green technology innovation development in China in 1990–2015. *Science of the Total Environment* v.696 <https://doi.org/10.1016/j.scitotenv.2019.134008>

Supplemental Resources:

7. James Kingham and Christine Donaldson (2015). OUR EARTH: ITS CLIMATE, HISTORY, AND PROCESSES (Consult Ashesi University Library).
8. Gate B. (2022) *How to Avoid Climate Disaster*

E-book Additional Resources Available at Ashesi

Additional Resources for Engineering and CS Students (Not Available at Ashesi)

9. Bakshi B.R.(2019). *Sustainable Engineering*. Cambridge Press Page 112 – Science, Engineering and the Environment

5. COURSE STRUCTURE, ASSESSMENTS, & ACTIVITIES

Course Structure

We will meet for 4.5 hours a week: two 1.5-hour lectures and one 1.5-hour tutorial. We will spread the class meetings between lectures, group exercises and discussions. The purpose of the lectures will be to introduce the major conceptual ideas and techniques that are relevant to the topic of the week. To this end, you will be expected to have completed your reading assignments prior to class so that our class time can be more interactive. The group exercises will provide an opportunity to acquire a set of very useful skills, while you develop yourself as a team worker. We will use the tutorial sessions to discuss ideas that are of interest or difficulty, and to translate the theoretical knowledge presented during lectures into practice.

Assessments and Activities

5.1 CANVAS

You are responsible for checking the course CANVAS site frequently for important announcements, details on assignments, and supplementary material.

5.2 Class Attendance and Participation

We will be covering a sizeable amount of information in a short amount of time, so your participation in class is essential to your success in the course. We expect you to attend class regularly and to take an active part in class. Note that class attendance may earn you up to 5% of the overall mark for the course.

5.3 Assignment

There will be **two** homework assignments to evaluate your comprehension of the assigned reading materials and discussion of concepts. Submission deadlines must be strictly adhered to.

5.4 Quizzes

There will be **three** quizzes, each covering materials on the preceding weeks. The duration of each test will be between 20 and 30 minutes and will be written during one of the class periods in the week.

5.5 Mid-Semester Assessment

There will be a mid-semester essay paper due before the mid-semester break. Full description and rubric will be available on CANVAS. (5 pages, not including cover page and references).

5.6 Final Assessment

There will be an end-of-semester research prospectus due during finals week. Full description and rubric will be available on CANVAS. (15-20 pages, not including cover page and references).

6. EVALUATION CRITERIA

Assignments are due on the dates listed, by 11:59 p.m. prompt in CANVAS. Late assignments will not be accepted.

Research Methods – Semester 2 (January–May) 2022 – Grade Breakdown

Type	Due Dates	Description	Points	% of Total
Attendance	Ongoing	Attendance and web throting for climate innitiatives around the world: cold calling presentations.	5	5%
Assignment	1. TBD 2. TBD	Two (2) Take-home Assignments 1. Unit 1: Carbon Cycle 2. Unit 2: Atmosphere composition and Ocean dynamics in climate	10	10%
Mid-Semester Assessment: Reflective Essay on Climate Innovation	TBD	Critical paper on climate change and technological innovation (1500 to 2000 words)	15	15%
Quizzes	TBD	Three (3) Quizzes 1. Science and evidence of climate change 2. Climate change mitigation 3. Climate change adaptation	15	15%

Final Assessment: Research Prospectus	TBD	Essay: Critical review of any strategic plan on climate change in Africa; sustainable cities, climate smart agric, non-fossil energy etc (15–20 pages)	40	40%
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Grading Scale	
85 – 100	A+ Excellent
80 – 84	A Excellent
75 – 79	B+ Very Good
70 – 74	B Good
65 – 69	C+ Average
60 – 64	C Fair
55 – 59	D+ Barely Satisfactory
50 – 54	D Weak Pass
Below 50	E Fail

STATEMENT ON DISABILITY AND MENTAL HEALTH SUPPORT
We recognize that you, as a student, may experience issues that may cause barriers to your learning, such as strained relationships, increased anxiety, feeling down and unmotivated, and

Note: You will be expected to complete all assignments and submit them by the stated due dates. Under no circumstances will late submissions be accepted. There are no make-up opportunities for any assignment, quiz, or examinations.

STATEMENT ON DIVERSITY

A true ethical leader of the kind Ashesi strives to create is inclusive and pulls everyone along to achieve the common goal. Inclusivity is about the collective and shared experiences of ALL the members of this class. Throughout this semester, we will draw significantly from the strengths of the diverse opinions, backgrounds, and experiences of each member of this class to facilitate and enrich our collective learning. As such, each opinion, experience, contribution, and disagreement will be valued, and feedback and disagreement given in the spirit of curiosity to understand better and engage with each situation of ambiguity in a manner that will make each member of this class feel included in all discussions. Ashesi University strives to provide a safe, inclusive, and equitable study environment. Ashesi insists on equity and opposes discrimination, including discrimination on the basis of gender, marital status, religious belief, ethical belief, color, race, ethnic or national origins, disability, age, political opinion, employment and economic status, as well as family status. Please call or email the instructor if you feel in any way excluded at any point in our class engagements throughout the semester.

difficulty in concentration due to a disability or an experience. Please know that in any of these situations, you can, and we encourage you to **seek help early** from the University's Counseling and Coaching Center. You can reach them through their **24/7 hotline at 0501569909**. **In addition, please let the instructor know how we can facilitate your learning. If you have a condition and need accommodation, please send the instructor an email or book an appointment to talk about it during office hours at the beginning of this course to discuss your situation and set up your support.**

STATEMENT ON ETHICS/PLAGIARISM

You should be able to say with confidence that all work that you submit for this course is your own work. Both purposeful and inadvertent plagiarism should be avoided.

Purdue University's Online Writing Lab has a succinct statement on plagiarism from Professor Irwin Weiser:

When writers use material from other sources, they must acknowledge this source. Not doing so is called plagiarism, which means using without credit the ideas or expressions of another. You are therefore cautioned (1) against using, word for word, without acknowledgment, phrases, sentences, paragraphs, etc., from the printed or manuscript material of others; (2) against using with only slight changes the materials of another; and (3) against using the general plan, the main headings, or a rewritten form of someone else's material. These cautions apply to the work of other students as well as to the published work of professional writers. (Purdue Online Writing Lab, 2020, para. 4)

Reference

Purdue Online Writing Lab. (2020). *Best practices for teachers*.

https://owl.purdue.edu/owl/avoiding_plagiarism/best_practices_for_teachers.html

No amount of plagiarism is acceptable. Penalties for plagiarism may include a reduction in your overall mark for the work of at least 20% and, in serious cases, a submission of the case to the AJC.

Please take concerns about plagiarism with the utmost seriousness. If you have any concerns about what constitutes plagiarism, please see either Instructor or the Faculty Intern, or visit the [Writing Centre](#) for further information.

According to the Indiana University "How to Recognize Plagiarism: Tutorials and Tests":

To avoid plagiarism, you must give credit when:

- You use another person's ideas, opinions, or theories.
- You use facts, statistics, graphics, drawings, music, etc., or any other type of information that does not comprise common knowledge.
- You use quotations from another person's spoken or written word.
- You paraphrase another person's spoken or written word. (Indiana University, 2020, paras. 1–2)

Reference

Indiana University. (2020). *How to recognize plagiarism: Tutorials and tests*.

<https://plagiarism.iu.edu/overview/shouldDo.html>

Climate Change and Global Innovation – Section A
SEMESTER TWO – 2023/2024

UNIT 1

Week	Topic	Readings/Videos	Assessment Due
1	Introduction to Earth's Climate System	Read: <ul style="list-style-type: none"> • Goose H, Chapter 1 Review/Watch: <ul style="list-style-type: none"> • • 	
2	Atmospheric and oceanic systems	Read: <ul style="list-style-type: none"> • Goose H, Chapter 1 Review/Watch: <ul style="list-style-type: none"> • 	
3	Science and evidence of climate change I: With intro to the IPCC	Read: <ul style="list-style-type: none"> • John C. Mutter(2020). Climate Change Science. Chapter Two Review/Watch: <ul style="list-style-type: none"> • Video: The Science of Climate Change https://youtu.be/raijlFglj6c • 	

4	Science and evidence of climate change II	<p>Read:</p> <ul style="list-style-type: none"> • John C. Mutter(2020). Climate Change Science. Chapter Two <p>Review/Watch:</p> <ul style="list-style-type: none"> • Guide to Understanding Climate Change https://youtu.be/3CM_KkDuzGQ • IPCC(2022) Climate Change Impacts, Adaptation and Vulnerability - https://youtu.be/SDRxfuEvqGg 	
5	Extreme weather conditions and natural disasters	<p>Read:</p> <ul style="list-style-type: none"> • Suraj Mal, R.B Singh, Christian Huggel (2018) <i>Climate Change, Extreme Events and Disaster Risk Reduction</i>. Springer 430662_1_En_BookFrontmatter_1..17 (springer.com) <p>Review/Watch:</p> <p>Climate change and extreme weather https://youtu.be/1jzQF_IElGk Linking extreme weather to climate change https://youtu.be/eB7xJ23E1t</p>	
6	Climate Change mitigation and innovation	<p>Read:</p> <p>Wang Q. (2019) Green technology innovation development in China in 1990–2015. <i>Science of the Total Environment</i> v.696 https://doi.org/10.1016/j.scitotenv.2019.134008</p> <p>Review/Watch:</p> <ul style="list-style-type: none"> • Bill Gates: Innovations against climate disaster: https://youtu.be/rhNxDP8e7p pgadmissions@contact.bham. 	

7	Climate Change adaptation and innovation	<p>Read:</p> <ul style="list-style-type: none"> Fankhauser S.(2017) Adaptation to Climate Change. Annual Review of Resource Economics DOI:10.1146/annurev-resource-100516-033554 Available at: (PDF) Adaptation to Climate Change (researchgate.net) <p>Review/Watch:</p> <ul style="list-style-type: none"> Adaptation Gap 2021 Report, UNEP AGR21.pdf Shaping the future of climate adaptation https://youtu.be/mA0mffbkwBM Bill Gates: Innovations against climate disaster: https://youtu.be/rhNxDP8e7p 	<p>Mid-Semester Assessment: Critical paper on climate change and technological innovation (1500 to 2000 words)</p> <p>DUE TBD by 11:59 p.m.</p>
Mid-Semester Break: T B D 2023/2024			
UNIT 2			
8	Global climate innovations	<p>Read:</p> <ul style="list-style-type: none"> Lenox M., Duff R., (2021). <i>The decarbonization imperative: transforming the global economy by 2050</i> . Stanford University Press <p>Review/Watch: UN Climate Change Global Innovation Hub UNFCCC Virtual tour of sustainable campuses and cities around the world: MIT, Stanford</p>	
9	Politics and global governance of climate change	<p>Read:</p> <ul style="list-style-type: none"> Bulkeley and Newell, Chapters 1 & 2 <p>Review/Watch:</p> <ul style="list-style-type: none"> IPCC, UNFCC and UNEP websites 	

10	Africa in climate change discourse: Climate justice and international negotiations	<p>Read: Mithika Mwenda, Patrick Bond(2020). <i>African climate justice: Articulations and activism</i>. Routledge (African climate justice 8 Articulations and activism Mithika Mwe (taylorfrancis.com))</p> <p>Review/Watch: Climate justice for Africa – Economy and ecology IPS Journal (ips-journal.eu)</p> <p>Climate Justice and Africa: https://youtu.be/ITorgRoDJD4</p>	
11	Climate change modelling and data analytics	<p>Read: Lee Hannah (2011) <i>The Climate System and Climate Change: Modeling the Climate System</i>. Elsevier https://doi.org/10.1016/B978-0-12-374182-0.00002-9</p> <p>Pages 13 -52</p> <ol style="list-style-type: none"> 1. Regional Climate Models 2. Commonly used GCMs 3. Emissions Scenarios 4. GCM Output <p>Review/Watch: The art of climate modeling: https://youtu.be/rl_MRcYsM1M</p>	

12	Sustainable business and engineering	<p>Read:</p> <p>12. Bakshi B.R.(2019). <i>Sustainable Engineering</i>. Cambridge Press Page 112 – Science, Engineering and the Environment</p> <p>13. Nosratabadi et al (2019)Sustainable Business Models: A Review <i>Sustainability</i>, 11(6), 1663; https://doi.org/10.3390/su11061663</p> <p>Review/Watch:</p> <p>14. Climate change and engineering - https://youtu.be/VVnv7sNwY8k</p> <p>15. Sustainable engineering - https://youtu.be/dzQnLcj-q7U</p>	
13	Climate Change and Clean Energy Seminar	<p>Read:</p> <ul style="list-style-type: none"> Furtado L.S (2019)Case study of the energy transition: Pueblo, Colorado. <i>The Electricity</i> vol 32, issue 8 <p>Review/Watch:</p> <p>16. Climate change and energy transitions in Africa - https://youtu.be/csUewYJnWJ8</p>	
14	Climate Change and personal responsibility; sustainable campuses(Ashesi Climate Actions)	<p>Read:</p> <p>Personal readings on climate change advocacy skills</p> <p>Review/Watch:</p> <ul style="list-style-type: none"> Review of Greta Thumberg’s speeches: https://youtu.be/B3jTuRKZ7F8 Virtual tour of sustainable campuses – students to take initiatives 	<p>Climate change and personal responsibility reflective paper(One page)</p> <p>DUE TBD By 11:59 pm</p>
15	Course Review & Sustainability Careers Exposition	<p>Read:</p> <p>TBD</p> <p>Review/Watch:</p>	<p>Participation in Climate Innovation Art and Exhibition : Voluntary Presentations</p>
Finals			

	Revision Period	No Reading	Participation in Global Climate Innovation Seminar
	Finals Week	No Reading	Final Assessment: Critical Essay 15 to 20 pages DUE TBD by 11:59 p.m.

Note: Assignment details are subject to change. We will notify you in advance of any changes.

Syllabus for the course:

SUSTAINABILITY AND SYSTEMS THINKING



Sustainability and Systems Thinking – Section A

1. GENERAL INFORMATION	
Course Code and Name:	Sustainability and Systems Thinking
Year / Semester:	2023 -2024/ Semester One (Fall)
Course Content Available On:	CANVAS – https://ashesi.instructure.com/login/canvas

Instructors	
Name: Gideon Osabutey	Name:
Office: Fab Lab 215	Office:
Phone: +233 555175013	Phone:
Email: gosabutey@ashesi.edu.gh	Email:
Office Hours:	Office Hours:

Faculty Interns	
Name:	Name:
Office:	Office:
Phone:	Phone:
Email:	Email:
Office Hours:	Office Hours

Times		Location
Lectures	Tuesdays 08:00–09:30 AM GMT/TBD	PNRB 100
	Thursdays 08:00–09:30 AM GMT/TBD	PNRB 100
Tutorials	Fridays 13:50–15:20 PM GMT/TBD	PNRB 100
Zoom LINK		

2. COURSE DESCRIPTION

This course will give students an understanding of the key challenges and pathways to sustainable development - that is, economic development that is also socially inclusive and environmentally sustainable. Students will be able to identify diverse ways to achieving a sense of purpose and reflect on their role in a socio-ecological system. They will demonstrate sustained growth in their learning of the interdisciplinary field(s) of sustainability by engaging key debates, concepts, critiques, and methods from sustainability scholarship across economics, politics, technology, environment among others. Systems thinking is a way of approaching problems that analyses how all the elements within a system influence one another; this course introduces students to systemic ways of analysing complex sustainability issues. Through discussions of complex nature of social problems like poverty, they will learn to recognise and understand cause and effect in complex systems.

Required of _____

Prerequisite(s):

3. COURSE OBJECTIVES (Student Learning Outcomes)

At the end of the course, students will be able to:

1. gain scientific knowledge regarding planetary boundaries processes and their influence on Africa's socio-economic development.
2. analyse and interpret current issues and debates related to sustainable development.
3. enhance their critical, analytical, and integrative skills for responding to sustainable development challenges.
4. explain the interconnectedness between the SDGs and global development outcomes.
5. explain how various attributes of sustainability (environmental, economic and social) can be applied by development practitioners and other stakeholders.
6. Examine complex sustainability issues by applying systems thinking

4. ASHESI LEARNING GOALS ADRESSED IN THIS COURSE

- **Ethics and Civic Engagement:** Students will be introduced to ethical considerations around environmental sustainability, including climate justice, responsible consumption and care for unborn generation.
- **Critical Thinking and Quantitative Reasoning:** The course allows for the application of critical thinking, persuasion, and presentation skills; critical reasoning around sustainable futures. Treatment of sustainability data analytics topics will foster quantitative reasoning.
- **Leadership and Teamwork:** Through team projects and in-class discussions, students will develop interpersonal skills required to work with people in producing results. Students will acquire critical awareness of sustainability leadership.
- **Communication:** The course contributes to student’s written communication development through critical writing assignments. Opportunities for articulative expressions via group discussions and presentations will be explored in class.
- **Technological Competence:** computer applications in climate and digital information literacies around sources of sustainability data are explored in class.

5. PRIMARY TEXTBOOKS/SECONDARY READINGS

Primary Reading:

1. Lisa Benson-Short (2023) *Sustainability and Sustainable Development. An Introduction* <https://rowman.com/ISBN/9781538135365/Sustainability-and-Sustainable-Development-An-Introduction>
2. Sanneh ES. (2018) *Systems Thinking for Sustainable Development*. Springer
3. Maslin M. (2021) *Climate change: a very short introduction* (4th. ed)

4. Wang Q. (2019) Green technology innovation development in China in 1990–2015. *Science of the Total Environment* v.696 <https://doi.org/10.1016/j.scitotenv.2019.134008>

Supplemental Resources:

5. Semis GK. (2021) Systems Thinking Research in Science and Sustainability Education: A Theoretical Note >>[Link](#)
6. James Kingham and Christine Donaldson (2015). OUR EARTH: ITS CLIMATE, HISTORY, AND PROCESSES (Consult University Library).
7. Gate B. (2022) *How to Avoid Climate Disaster*

Additional Resources for Engineering and CS Students

8. Bakshi B.R.(2019). *Sustainable Engineering*. Cambridge Press Page 112 – Science, Engineering and the Environment

5. COURSE STRUCTURE, ASSESSMENTS, & ACTIVITIES

Course Structure

We will meet for 4.5 hours a week: two 1.5-hour lectures and one 1.5-hour tutorial. We will spread the class meetings between lectures, group exercises and discussions. The purpose of the lectures will be to introduce the major conceptual ideas and techniques that are relevant to the topic of the week. To this end, you will be expected to have completed your reading assignments prior to class so that our class time can be more interactive. The group exercises will provide an opportunity to acquire a set of very useful skills, while you develop yourself as a team worker. We will use the tutorial sessions to discuss ideas that are of interest or difficulty.

Assessments and Activities

5.1 CANVAS

You are responsible for checking the course CANVAS site frequently for important announcements, details on assignments, and supplementary material.

5.2 Class Attendance and Participation

We will be covering a sizeable amount of information in a short amount of time, so your participation in class is essential to your success in the course. We expect you to attend class regularly and to take an active part in class. Note that class attendance may earn you up to 5% of the overall mark for the course.

5.3 Assignment

There will be **two** assignments to evaluate your comprehension of the assigned reading materials and discussion of concepts. Submission deadlines must be strictly adhered to.

5.4 Quizzes

There will be **three** quizzes, each covering materials on the preceding weeks. The duration of each test will be between 20 and 30 minutes and will be written during one of the class periods in the week.

5.5 Mid-Semester Assessment

There will be a mid-semester essay paper due before the mid-semester break. Full description and rubric will be available on CANVAS. (5 pages, not including cover page and references).

5.6 Final Assessment

There will be an end-of-semester course reflection report (term paper), due during finals week. Full description and rubric will be available on CANVAS. (10-12 pages, not including cover page and references).

6. EVALUATION CRITERIA

Assignments are due on the dates listed, by 11:59 p.m. prompt in CANVAS. Late assignments will not be accepted.

Sustainability and Systems Thinking – Grade Breakdown				
Type	Due Dates	Description	Points	% of Total
Attendance	Ongoing	Attendance and sharing of course journal with the class.	5	5%
Assignment	1. TBD 2. TBD	Two (2) Assignments 1. Unit 1: Sustainable socio-economic Development 2. Unit 2: Environmental sustainability	10	10%
Mid-Semester Assessment: Reflective Essay on Climate Innovation	TBD	Critical paper on applying system thinking to sustainability solutions (1500 to 2000 words)	15	15%
Quizzes	TBD	Three (3) Quizzes 1. Planetary Boundaries 2. Five Capitals in Sustainability 3. Weak vs strong sustainability	15	15%

Final Assessment: Reflective Report on students' learning throughout the course.	TBD	Essay: Option A: Critical reflection on the SDGs and sustainable development governance systems (e.g., what kind of socio-political systems, including good governance principles, can help Africa attain the SDGs?)(10 – 12 pages) Option B: How is global poverty a systemic problem? (10–12 pages)	40	40%
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<u>Grading Scale</u>	
85 – 100	A+ Excellent
80 – 84	A Excellent
75 – 79	B+ Very Good
70 – 74	B Good
65 – 69	C+ Average
60 – 64	C Fair
55 – 59	D+ Barely Satisfactory
50 – 54	D Weak Pass
Below 50	E Fail

Note: You will be expected to complete all assignments and submit them by the stated due dates. Under no circumstances will late submissions be accepted. There are no make-up opportunities for any assignment, quiz, or examinations.

STATEMENT ON DIVERSITY

A true ethical leader of the kind Ashesi strives to create is inclusive and pulls everyone along to achieve the common goal. Inclusivity is about the collective and shared experiences of ALL the members of this class. Throughout this semester, we will draw significantly from the strengths of the diverse opinions, backgrounds, and experiences of each member of this class to facilitate and enrich our collective learning. As such, each opinion, experience, contribution, and disagreement will be valued, and feedback and disagreement given in the spirit of curiosity to understand better and engage with each situation of ambiguity in a manner that will make each member of this class feel included in all discussions. Ashesi University strives to provide a safe, inclusive, and equitable study environment. Ashesi insists on equity and opposes discrimination, including discrimination on the basis of gender, marital status, religious belief, ethical belief, color, race, ethnic or national origins, disability, age, political opinion, employment and economic status, as well as family status. Please call or email the instructor if you feel in any way excluded at any point in our class engagements throughout the semester.

STATEMENT ON DISABILITY AND MENTAL HEALTH SUPPORT

We recognize that you, as a student, may experience issues that may cause barriers to your learning, such as strained relationships, increased anxiety, feeling down and unmotivated, and difficulty in concentration due to a disability or an experience. Please know that in any of these situations, you can, and we encourage you to **seek help early** from the University's Counseling and Coaching Center. You can reach them through their **24/7 hotline at 0501569909**. **In addition, please let the instructor know how we can facilitate your learning. If you have a condition and need accommodation, please send the instructor an email or book an appointment to talk about it during office hours at the beginning of this course to discuss your situation and set up your support.**

STATEMENT ON ETHICS/PLAGIARISM

You should be able to say with confidence that all work that you submit for this course is your own work. Both purposeful and inadvertent plagiarism should be avoided.

Purdue University's Online Writing Lab has a succinct statement on plagiarism from Professor Irwin Weiser:

When writers use material from other sources, they must acknowledge this source. Not doing so is called plagiarism, which means using without credit the ideas or expressions of another. You are therefore cautioned (1) against using, word for word, without acknowledgment, phrases, sentences, paragraphs, etc., from the printed or manuscript material of others; (2) against using with only slight changes the materials of another; and (3) against using the general plan, the main headings, or a rewritten form of someone else's material. These cautions apply to the work of other students as well as to the published work of professional writers. (Purdue Online Writing Lab, 2020, para. 4)

Reference

Purdue Online Writing Lab. (2020). *Best practices for teachers*.

https://owl.purdue.edu/owl/avoiding_plagiarism/best_practices_for_teachers.html

No amount of plagiarism is acceptable. Penalties for plagiarism may include a reduction in your overall mark for the work of at least 20% and, in serious cases, a submission of the case to the AJC.

Please take concerns about plagiarism with the utmost seriousness. If you have any concerns about what constitutes plagiarism, please see either Instructor or the Faculty Intern, or visit the [Writing Centre](#) for further information.

According to the Indiana University "How to Recognize Plagiarism: Tutorials and Tests":

To avoid plagiarism, you must give credit when:

- You use another person's ideas, opinions, or theories.
- You use facts, statistics, graphics, drawings, music, etc., or any other type of information that does not comprise common knowledge.
- You use quotations from another person's spoken or written word.
- You paraphrase another person's spoken or written word. (Indiana University, 2020, paras. 1– Reference

Indiana University. (2020). *How to recognize plagiarism: Tutorials and tests*.

<https://plagiarism.iu.edu/overview/shouldDo.html>

Sustainability and Systems Thinking – Section A
SEMESTER 1 2023/2024

UNIT 1

Week	Topic	Readings/Videos	Assessment Due
1	Introduction to sustainable Development	<p>Read:</p> <ul style="list-style-type: none"> • Benton-short L., Chapter 1 <p>Review/Watch:</p> <ul style="list-style-type: none"> • (1706) Our Common Future - YouTube 	
2	Inequality around the world	<p>Read:</p> <ul style="list-style-type: none"> • Benton-short L., Chapter 1, 2, 5 <p>Review/Watch:</p> <ul style="list-style-type: none"> • (1699) Presentation of the World Inequality Report - World Inequality Conference 2021 - YouTube • (1699) The Great Divide - YouTube 	
3	History of Economic Development: The Industrial Revolution	<p>Read:</p> <ul style="list-style-type: none"> • Mohajan, Haradhan (2019): <i>The First Industrial Revolution: Creation of a New Global Human Era</i>. Published in: Journal of Social Sciences and Humanities , Vol. 5, No. 4 (17 October 2019): pp. 377-387. <p>Review/Watch:</p> <ul style="list-style-type: none"> • Absolute History – Victorian Industrial Revolution https://youtu.be/xyUOBMOUNQk 	

4	The MDG, SDGS and end of extreme poverty	<p>Read:</p> <ul style="list-style-type: none"> • Benton-short L., Chapters 1,2,3,4 <p>Review/Watch:</p> <ul style="list-style-type: none"> • (1699) How do the SDGs differ from the MDGs? - YouTube 	
5	Introduction to Systems Thinking	<p>Read:</p> <ul style="list-style-type: none"> • Sanneh ES, Chapter 1 • Roxa et al.(2018) Framework for sustainable tourism using system thinking. https://doi.org/10.1080/13683500.2018.1534805 <p>Review/Watch:</p> <ul style="list-style-type: none"> • https://mahb.stanford.edu/blog/systems-thinking-can-help-buildsustainable-world-beginning-conversation/ • https://www.rit.edu/sustainabilityinstitute/blog/sustainability-allabout-systems-thinking-heres-why • Systems thinking for sustainability - https://youtu.be/gjWMMndBpOs 	

6	Sustainability Issues and Systems Thinking	<p>Read:</p> <ul style="list-style-type: none"> Rehman et al(2019) Applying systems thinking to flood disaster management for a sustainable development https://doi.org/10.1016/j.ijdr.2019.101101 <p>Review/Watch:</p> <ul style="list-style-type: none"> Bill Gates: Innovations against climate disaster: https://youtu.be/rhNxDP8e7p 	
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7	Environmental Sustainability	<p>Read:</p> <ul style="list-style-type: none"> Chege SM. (2020) The influence of technology innovation on SME performance through environmental sustainability practices in Kenya https://doi.org/10.1016/j.techsoc.2019.101210 <p>Review/Watch:</p> <ul style="list-style-type: none"> (1699) Organizations and Environmental Sustainability - YouTube 	<p>Mid-Semester Assessment: Critical paper on systems thinking and sustainability (1500-word limit)</p> <p style="text-align: center;">DUE TBD by 11:59 p.m.</p>
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Mid-Semester Break:

UNIT 2

8	Economic Growth within planetary boundaries	<p>Read:</p> <ul style="list-style-type: none"> Lade, S.J., Steffen, W., de Vries, W. <i>et al.</i> Human impacts on planetary boundaries amplified by Earth system interactions. <i>Nat Sustain</i> 3, 119–128 (2020). https://doi.org/10.1038/s41893-019-0454-4 <p>Review/Watch:</p> <ul style="list-style-type: none"> (1699) Four tipping points Africa can expect from climate change Francois Engelbrecht TEDx Johannesburg - YouTube (1699) 26. The Planetary Boundaries - YouTube 	
9	Social and political sustainability	<p>Read:</p> <ul style="list-style-type: none"> Radu M.(2015) Political stability and sustainable economic growth https://www.sciencedirect.com/science/article/pii/S2212567115013246 <p>Review/Watch:</p> <ul style="list-style-type: none"> (1699) What is Social and Sustainable Procurement? - YouTube 	
10	Addressing Climate Change	<p>Read:</p> <p>Mithika Mwenda, Patrick Bond(2020). <i>African climate justice: Articulations and activism</i>. Routledge (African climate justice 8 Articulations and activism Mithika Mwe (taylorfrancis.com))</p> <p>Review/Watch:</p> <p>Climate justice for Africa – Economy and ecology IPS Journal (ips-journal.eu)</p> <p>Climate Justice and Africa: https://youtu.be/ITorgRoDJD4</p>	

11	Biodiversity Crisis	<p>Read:</p> <ul style="list-style-type: none"> • Benton-short, Chapter 15 <p>Review/Watch:</p> <ul style="list-style-type: none"> • Parks L. and Tsioumani E. (2023) Transforming biodiversity governance? Indigenous peoples' contributions to the Convention on Biological Diversity https://doi.org/10.1016/j.biocon.2023.109933 • (1699) Why we need to fear the loss of biodiversity as much as climate change DW News - YouTube • (1699) What is Biodiversity? - YouTube 	
12	Sustainable business and engineering	<p>Read:</p> <ol style="list-style-type: none"> 12. Bakshi B.R.(2019). <i>Sustainable Engineering</i>. Cambridge Press Page 112 – Science, Engineering and the Environment 13. Nosratabadi et al (2019)Sustainable Business Models: A Review <i>Sustainability</i>, 11(6), 1663; https://doi.org/10.3390/su11061663 <p>Review/Watch:</p> <ol style="list-style-type: none"> 14. Climate change and engineering - https://youtu.be/VVnv7sNwY8k 15. Sustainable engineering - https://youtu.be/dzQnLcj-q7U 	

13	Sustainable Cities & Digital Societies	<p>Read:</p> <ul style="list-style-type: none"> Abubakar IR., Aina YA.,(2019) The prospects and challenges of developing more inclusive, safe, resilient and sustainable cities in Nigeria https://www.sciencedirect.com/science/article/abs/pii/S0264837718318933 Friedman A.(2023)<i>The Sustainable Digital City</i>, Springer - LINK <p>Review/Watch:</p> <ul style="list-style-type: none"> (1706) Smart green world? Making digitalization work for sustainability Tilmann Santarius TEDxTUBerlin - YouTube 	
14	Intro to Complex System Dynamics: focus on poverty dynamics.	<p>Read:</p> <ul style="list-style-type: none"> Cimadamore A. (2021) Dynamics of poverty production https://www.taylorfrancis.com/chapters/edit/10.4324/978100303718729/dynamics-poverty-production-alberto-cimadamore Purwono et al(2021). Poverty dynamics in Indonesia: empirical evidence from three main approaches https://www.sciencedirect.com/science/article/pii/S245229292100062X <p>Review/Watch:</p> <ul style="list-style-type: none"> Poverty Persistence and Poverty Dynamics https://wol.iza.org/articles/poverty-persistence-and-poverty- 	<p>Reflective paper: Addressing persistent and systemic poverty (one page)</p> <p>DUE TBD By 11:59 pm</p>
		<p>dynamics/long</p> <ul style="list-style-type: none"> (1703) System Dynamics: Systems Thinking and Modeling for a Complex World - YouTube 	

15	Wellbeing Seminar (Mental health, fitness and social connections)	Read: TBD Review/Watch: <a href="http://rritrends.res-
 agora.eu/uploads/22/Towards_a_Sustainable_Wellbeing_Society.pdf">http://rritrends.res- agora.eu/uploads/22/Towards_a_Sustainable_Wellbeing_Society.pdf	Participation in a webinar On mental health and healthy social relations. (Voluntary Participation)
Finals			

	Revision Period	No Reading	<p>Participation in Seminar:</p> <p>Environmental and Social Impact Assessment</p> <p>Bonus session:</p> <p>Sustainability Careers</p>
	Finals Week	No Reading	<p>Final Assessment:</p> <p>Critical Essay (10 to 12 pages)</p> <p>DUE</p> <p>TBD by</p> <p>11:59 p.m.</p>

Note: Assignment details are subject to change. We will notify you in advance of any changes.