



Sungkyunkwan University (SKKU) International Summer Semester (ISS) 2024

# Climate Change Risk: Science, Technology and Policy

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## SHORT COURSE DESCRIPTION

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Climate change poses an unprecedented threat to sustainable development worldwide. This interdisciplinary course provides students with the concepts, tools, and frameworks to understand climate risks and advance resilient, equitable climate solutions aligned with the Sustainable Development Goals (SDGs).

Through interactive lectures, discussions, and projects, students will examine the latest climate science and predictions, impacts across vulnerable sectors, and innovations in adaptation and mitigation technology. The course offers an in-depth look at climate finance instruments, carbon pricing mechanisms, and climate-related financial disclosures needed to mobilize action. Students will also explore analytical approaches for climate risk assessment, resilience pathways, proposal writing and transformations to embed climate readiness in development planning.

Leveraging insights from science, technology and applying learning through case studies, the course empowers students to contribute meaningfully to local and global climate actions. Participants will gain interdisciplinary knowledge, systems thinking skills, and sustainability values to implement science-based climate strategies that better society, the economy, and the environment.

## READING MATERIALS

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A list of reading materials will be provided with each lecture to help students familiarize themselves with the topics and gain an in-depth understanding of the content. These readings will include summaries and briefs from major institutions like the IPCC, Green Climate Fund and World Bank to provide an overview of key concepts. Applied examples through case studies, academic articles, and policy briefs will also be included to ground concepts in real-world climate solutions and illustrate successes and challenges. The reading lists will be targeted, not overly extensive, to provide enrichment without overburdening students. They will aim to complement the classroom content so students can engage actively in discussions and interactive activities. The goal is for students to complete the readings prior to each session in order to come prepared with knowledge to support a rewarding learning experience. Please let me know if you require any other specifics regarding the reading materials.

## COURSE REQUIREMENTS AND GRADING

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SKKU regulations require students to attend at least 80% of all classes.

Student work portfolio (quizzes, presentations, etc.)	40%
Research essay or report	40%
Self and peer assessment	30%

Students are required to submit all required assessment pieces for marking. SKKU policies about late assignments and penalties will apply.

Students are required to research and write a 2,000 words essay or report about climate change risk and sustainable development issues of their choice.

Grades for your performance in this course will be awarded in accordance with the following scheme:

F	1-49	Fail (F)
P	50-64	Pass (B)
C	65-74	Credit (B+)
D	75-84	Distinction (A)
HD	85-100	High Distinction (A+)

## **COURSE SCHEDULE**

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### **– WEEK I –**

#### Monday (1 July)

##### **Introduction of Climate Change Risk: Science, Technology and Policy**

- I. Climate change risk
- II. The social and economic impacts of climate change
- III. The role of individuals in addressing climate change
- VI. The concept of sustainable development
- VII. The link between climate change and other SDGs
- VIII. Global frameworks for 2030
- IX. Policy, legislation, and institutional frameworks
- X. ESG and SDG
- XI. Conclusion

#### Tuesday (2 July)

##### **Climate change science and Technology**

- I. Welcome and introduction
- II. Climate science and IPCC
- III. The greenhouse effect and climate change
- IV. Climate Feedback Mechanisms
- V. Climate Modeling and Predictions
- VI. Climate information and early warning systems
- VIII. Conclusion

#### Wednesday (3 July)

##### **Climate Change Impacts on Key Sectors**

- I. Introduction
- II. Climate-change Impacts
- III. Key Sectors
  - Human Health
  - Agriculture and Food Security
  - Water
  - Infrastructure
  - Energy
  - Education

Thursday (4 July)

### **Introduction to Climate Risk Assessment**

- I. Key concepts
- II. Climate risk assessment
- III. Hazard Assessment
- IV. Vulnerability Assessment
- IV. Risk assessment and adaptation priorities
- III. Conclusion

– WEEK II –

Monday (8 July)

### **Climate Change Adaptation**

- I. Introduction
- II. Strategies for climate change adaptation
- III. Policy and regulatory frameworks for climate change adaptation
- V. Challenges and barriers to climate change adaptation
- VI. Role of individuals and communities in climate change adaptation

**Group Discussion**, an example could be:

- A group discussion on the challenges and opportunities for climate change adaptation
  - Have students share their own experiences with climate change impacts and adaptation efforts in their communities
- VII. Conclusion
    - Summarize the key points covered in the module
    - Preview the next module

Tuesday (9 July)

### **Climate change mitigation**

- I. Welcome and introduction
- II. Key concepts
- III. Global Climate Action
- IV. Mitigation Strategies and Solutions
- V. Role of government in mitigating climate change
- VI. Role of international organizations in mitigating climate change
- VII. Role of Cities in Mitigation
- VIII. Challenges and barriers to climate change mitigation

Wednesday (10 July)

**Workshop on developing climate change mitigation and adaptation projects**

- I. Project concept
- II. Climate rational
- III. Theory of change

Thursday (11 July)

**Assignment presentation**

- I. Student group presentations
  - Have each student group present their climate risk assessment for their assigned local community
  - Allow time for questions and discussion from the rest of the class
- II. Reflection and critique
  - Ask students to reflect on their own assessment and the assessments presented by other groups
  - Encourage constructive criticism and feedback from peers

– WEEK III –

Monday (15 July)

**Climate Financing and Loss and Damage**

- I. Introduction
- II. Climate finance mechanisms
- III. Climate finance instruments
- IV. Multilateral Channels for Climate Finance
- V. Bilateral Channels for Climate Finance
- VI. Regional and National Channels for Climate Finance
- VII. Climate finance challenges
- VIII. Loss and Damage
- IX. Case Studies

Tuesday (16 July)

**Climate change financial disclosure**

- I. Introduction
- II. Climate-related financial disclosure frameworks
  - TCFD (Task Force on Climate-related Financial Disclosures)
  - SASB (Sustainability Accounting Standards Board)
  - CDP (Carbon Disclosure Project)
- III. Loss and damage assessment

Wednesday (17 July)

**Carbon Markets, Pricing, and Offsets**

- I. Introduction
- II. Carbon Market
- III. Carbon Pricing
- IV. Overview of National Policies on Carbon Pricing and Market
- V. Overview of International Policies on Carbon Pricing
- VI. Carbon Offsets
- V. Carbon Accounting
- VII. Conclusion

Thursday (18 July)

**Assignment 2 preparation/guidance day**

– WEEK IV–

Monday (22 July)

**Climate Resilient Development**

- I. Understanding Climate Resilience
- II. Understanding Climate Resilient Development
- III. Pathways for Climate Resilient Development
- IV. Transformations in Support of CRD Pathways
- V. Linking Development and Climate Action
- VI. System Transitions to Climate Resilient Development
- VII. Enabling Conditions for Near-Term System Transitions
- VIII. Macroeconomic Policies
- IX. Role of the Private Sector
- X. Case Study

Tuesday (23 July)

**Presentation of project assignment**

Wednesday (24 July)

**Conclusion and self-assessment**