

CCS Course Descriptions

Revised 20 August 2026

CCS5101 Climate Change – The Science and Policy

The course is a blend of physical, human and political geographies, providing an overview of the entire gamut of topics under climate change. The course is centred on how science factors into global (climate) policy making. The topics to be discussed include the basic science of climate change, climate scenarios and climate impacts, climate policies international agreements, protocols, frameworks, and the human and political dimensions in tackling climate change towards adaptation and mitigation. The course will be taught/co-taught by faculty members under the three research groups: Tropical Environmental Change (TEC), Politics, Economies & Space (PEAS) and Social Cultural Geographies (SCG), of the Dept. of Geography, including guest lecturers, where relevant.

CCS5102 Sustainability and Climate Change

"Sustainability" has become a guiding principle across diverse sectors, with public and private actors alike underscoring its importance for achieving goals for planetary health, social welfare, and economic well-being. With the promise of win-win solutions across competing environmental and economic interests, sustainability appears to offer answers to intractable and interconnected problems, including those of climate change and biodiversity loss. This course critically assesses the promises of sustainability by examining how the concept has been understood, institutionalised, and contested across multilateral, national, corporate, and community settings, through a close examination of current sustainability theory and practice. By the end of the course, students will be prepared to analyze and critically evaluate sustainability frameworks, policies and proposed solutions in real-world contexts.

CCS5103 Political Economy of Climate Change and Sustainable Development

This course introduces the political and economic dimensions of climate governance that shape sustainable development goals and ecological outcomes. It aims to develop an understanding of key issues at the policy-science interface of climate governance. Students will learn about the unequal spatial and social distribution of climate risks and impacts that affect food security, biodiversity and climate adaptation at local, urban, national, regional (ASEAN) and global scales. Combining lectures, seminar-style discussions, assignments and student presentations, the course will bring insights about concepts such as climate justice and nature-based solutions that have basic and applied policy relevance for Asian contexts.

CCS5104 Methods and Practice in Sustainability

The course introduces students to the principles and practice of research design. It adopts an epistemologically grounded approach to learning social science research methods and how these can be applied to research projects on sustainability. Students will be introduced to three philosophies of knowledge, namely positivism, hermeneutics and constructivism. They will learn how to select suitable research methods in sustainability informed by these 'ways of knowing'. Specifically, the course will introduce research techniques that include oral/aural, visual and practice-based approaches.

CCS5201 Introduction to Climate Modelling

The course introduces the science and techniques of climate modelling through lectures and hands-on applications. In short, this course explains how climate models work. The objective of this course is for the students develop a basic understanding of climate models work and how they 'add value' in climate research. The course will provide good insights into the principles that govern the earth system and modelling them, through lectures, hands-on training and assignments. The students will also be introduced to climate data and will be guided to perform some fundamental data analyses for model evaluations and climate projections for the future. The course is helpful to anyone interested in both weather and climate science.

CCS5202 Climate Risk, Adaptation Pathways and Resilient Worlds

Climatic hazards and the risks that societies are facing are rapidly changing and becoming increasingly challenging to assess and manage. This course explores how we understand complex and cascading climate risks, at the intersection of hazards, exposure, and systemic vulnerability, across social-ecological systems, and how cross-scalar hazardscapes unfold. We examine how social and ecological tipping points are detected, how climate risk management is undertaken, and how adaptation pathway planning helps address everyday barriers and limits to adaptation while opening up spaces for transformative and just adaptation. Via a variety of case studies, the course also evaluates new approaches to and methodologies for situated weathering and often contested resilience-in-the-making, in diverse contexts ranging from large-scales fires to embodied thermal insecurities.

CCS5203 Resilience of Socio-Ecological Systems

Present-day society depends heavily on social-ecological systems as a source of much of the raw materials, food, water and energy it relies upon. Social-ecological systems are characterized by dynamic and complex interactions between humans and the environment. Conventional management approaches emphasizing system efficiency may inadvertently reduce resilience, pushing critically important social-ecological systems towards unpredictable behaviour, regime shifts, or collapse. Through case studies and student-led discussion, this course will cover a variety of conceptual and analytical frames through which to filter complexity and enhance resilience of social-ecological systems.

CCS5204 Water, Food and Energy Insecurities

The course discusses key issues in the nexus among water, food and energy, in the context of climate change. The course explores the implications of viewing this nexus as a 'resource scarcity' through case studies that examine trade-offs and implications for societal flourishing, economic growth, and environmental quality. We delve into present-day impacts and possible future trajectories, including debates on what constitutes sustainable resource use at local, regional, and global scales. The course aims to foster a supportive environment where students can discuss and apply multiple analytical frameworks to grapple with humanity's grand resource challenges.

CCS5205 Sustainable Finance

The course introduces the origins, theories, practices, geographies, and debates on sustainable finance. It explains how finance, through its instruments, markets, and institutions affects and is affected by economic, social, and environmental issues, at all scales, from individual households and firms, through nations, to global organizations. It provides students with enhanced financial literacy and ability to understand financial data, including the application of financial analysis to various sectoral and geographical contexts. By the end students will gain a better understanding on how the financial system can contribute to sustainable development and how it needs to be transformed to do so.

CCS5206 How to Live Well on a Damaged Planet

The UN Sustainable Development Goals (SDGs), launched in 2015, offer a sweeping vision for improving human wellbeing, protecting the planet, and enabling all to “live well on a damaged planet.” Yet, for many, this vision of sustainable development has proven unsatisfactory, and even, contradictory. This course traces the evolution of “sustainable development,” interrogates its dominant institutions and metrics, and explores critical alternatives such as ecofeminism, commoning, and climate justice. We survey global movements including food sovereignty, the People’s health movement, the solidarity economy, degrowth, and *Buen Vivir*. A project-based, active learning approach invites students to reflect on and imagine their own visions for living well.

CCS5207 Coastal Vulnerability, Risk and Adaptation

Climate change and sea-level rise threaten the existence and livelihoods of more than 400 million people who live in low-lying coastal areas. This 10-day field-based course explores the vulnerability and risk posed by sea-level rise in coastal communities and examines adaption approaches and implementation strategies adopted. Using field examples students will gain an understanding of the real versus perceived threats to coastal communities and will introduce approaches to conceptualise and quantify vulnerability and determine risk profiles in coastal settings. The course will also explore the robustness of adaption approaches and implementation in coastal settings and will contrast developed and developing country approaches.

CCS5208 Urban Climate Change

This course explores the interconnected global megatrends of climate change and urbanization that transform human life. It examines the physical characteristics of cities and their effects on surface energy and water balances, offering a scientific foundation to understand urban climate, including temperature, airflow, moisture, radiation, and precipitation patterns. Students will be introduced to various tools such as observations, numerical modeling, and AI to investigate practical urban climate issues related to human health, city planning, urban design, and global warming. The course covers both how cities are affected by climate change and how cities are contributing to climate change.

CCS5209 Urban Sustainability Futures

This course explores the evolving relationship between cities and sustainability through the lens of smart and eco-city developments. It critically investigates how technological

innovation, urban planning, and governance intersect in the making of current and future cities, emphasizing on their sustainability. Key themes include experimental urbanism, low-carbon transitions, socio-technical infrastructures, and new technologies such as AI. Drawing on global case studies, students will engage with diverse urban sustainability models and assess their social, ecological, and political implications. Through collaborative learning students will apply geographical thinking to contemporary urban sustainability dilemmas requiring critical perspectives, thinking out-of-the-box and, ultimately, new answers.

CCS5210 Global Change and the Terrestrial Ecosystems

Contemporary global change is defined by two major megatrends: Climate Change, and Land Use and Land Cover Change (LUCC). These forces have profoundly affected natural ecosystems, altering their structure, function, and the essential services they provide to humanity. This course offers an advanced overview of the interactions between global change and key biogeochemical processes in terrestrial ecosystems—such as carbon, water, and nutrient cycles. Building on this foundation, students will explore critical environmental and sustainability issues, including food security, reforestation, and blue carbon restoration.

CCS5211 Air Pollution: Science and Solutions

This course explores air pollution as both a scientific and societal challenge, asking questions such as: Why does air pollution matter? Who is most affected? How can we solve it? Students will examine major air pollutants, atmospheric processes, public health and environmental impacts, urban air quality, and regional issues. The course also covers monitoring and modelling tools, policy and governance solutions, and international cooperation efforts. By the end of the course, students will be able to integrate scientific, geographical, and policy insights to address air pollution as a critical dimension of climate change and sustainability.

CCS5212 Critical Approaches to Corporate Sustainability

The corporation is one of the primary forces organizing contemporary life. Corporate interests have transformed the natural world, and corporate behaviors have determining effects on planetary futures. In this course, we consider the corporation as a social, economic, and political form, the constitution and exercise of corporate power, and recent efforts – internal and external – to regulate corporate behaviors under new rubrics of social and environmental sustainability. This course offers students the opportunity to critically examine the nature of the corporation, the relationship between corporations, peoples, and the environment, and the changing meaning of sustainability within and beyond corporate contexts.

CCS5301 Research Project in Climate Change and Sustainability

This course provides the opportunity for students to conduct an in-depth research project as part of the MSc in Climate Change and Sustainability. Students are required to apply relevant research approaches and techniques under the guidance of an advisor to a problem in the field, and to write the research and its analyses in the form of a short thesis (10,000 words maximum).