



## Lahore University of Management Sciences

### Course Code – Climate Change: Science, Impact, and Policy Spring 2022

Instructor	Dr Amna Ijaz
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TA Office Hours	N/A
Course URL (if any)	N/A

#### COURSE TEACHING METHODOLOGY

- Teaching Methodology: The course is designed to be taught in synchronous settings.
- Lecture details: There will be live-interaction lectures only.

#### COURSE BASICS

Credit Hours	3			
Lecture(s)	Nbr of Lec(s) Per Week	2	Duration	75 minutes
Recitation/Lab (per week)	Nbr of Lec(s) Per Week	N/A	Duration	N/A
Tutorial (per week)	Nbr of Lec(s) Per Week	N/A	Duration	N/A

#### COURSE DISTRIBUTION

Core	No
Elective	Yes
Open for Student Category	3-4 <sup>th</sup> year undergraduate students and all graduate students from all departments/schools
Close for Student Category	Undergraduate freshmen

#### COURSE DESCRIPTION

The Earth's climate is dynamic – it has continuously changed in the past and it will continue to do so in the future. Climate science and dialogue about man-induced climate change is a popular feature of news and scientific communication; however, the basis of climate change, its driving forces, and the nature and magnitude of its implications is poorly understood by the public, particularly in Pakistan. This lack of understanding is rooted in a lack of public-accessible discourse as well as dearth of relevant early, school-level learning opportunities related to climate and Earth sciences. A historic agreement to limit climate change and rise in global temperatures to 1.5°C was reached at the 21st Conference of the Parties (COP21) in December 2015 in Paris – now called the famous Paris Agreement. Pakistan is signatory to this agreement to show our acknowledgement of global climate issues and willingness to make our contribution for a better future. Therefore, it is essential that public be knowledgeable about the Paris Agreement and climate change, in general, to contribute toward a sustainable and safer future.

This course will provide foundational concepts of the science behind climate and the natural and anthropogenic drivers that have historically changed it to an extent of being a threat to a sustainable global future. These concepts will include Earth's climate system, its dynamics, energy feedback loops, and history of climate and climate change. Particularly, anthropogenic climate change will be reviewed at the science-policy interface to isolate major causes and possible solutions. Basic energy infrastructure and policy will be discussed in connection with environmental and climate change. International and national mitigation and adaptation strategies will be reviewed and critiqued. Specific policy topics that will be covered include, but are not limited to, history of climate policy, impediments to sustainable solutions, national and international developments since the Paris Agreement, and future implementation pathways suitable in Pakistan's current climate-relevant policy scenario.

#### COURSE PREREQUISITE(S)

N/A
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### COURSE OBJECTIVES

<i>This course is designed to give students an opportunity to:</i>	
<ul style="list-style-type: none"> <li>• CO1.....</li> <li>• CO2.....</li> <li>• CO3.....</li> <li>• CO4.....</li> </ul>	<ul style="list-style-type: none"> <li>Understand the evolution of climate and appreciate its complexity and functioning among other Earth systems</li> <li>Understand basic and contemporary issues in climate science and how they differ in developed and developing regions</li> <li>Acknowledge climate change as an anthropogenically-driven global problem</li> <li>Be empowered to think critically about issues in climate science and how policies, legislations, and individual behaviours impact future climate</li> </ul>

### LEARNING OUTCOMES

<i>By the completion of the course, students will be able to:</i>	
<ul style="list-style-type: none"> <li>• CLO1.....</li> <li>• CLO2.....</li> <li>• CLO3.....</li> <li>• CLO4.....</li> <li>• CLO5.....</li> </ul>	<ul style="list-style-type: none"> <li>Describe the relationship between the geological and climatic development of the Earth, climatic evolution, and environmental changes that have occurred over different climatic time scales</li> <li>Converse about and critique current energy politics and energy systems related to climate change</li> <li>Describe the effect of climate change on society and how society adapts to and mitigates the effects of climate change</li> <li>Relate climate science and policy to their major area of study (applications for humanities, engineering, life science, etc.)</li> <li>Identify reliable sources of information, analyse them, and articulate their concerns verbally and in written form about climate change in groups or individually</li> </ul>

### GRADING BREAKUP

HW Assignment(s).....	15%
Class participation (on peer presentations).....	5%
Overall class participation.....	5%
First panel discussion (simulated conference).....	10%
Moderated debate.....	10%
Project/presentation (documentary analysis).....	15%
Second panel discussion.....	10%
Final examination.....	30%

### EXAMINATION DETAIL

Midterm Exam	Yes/No: <b>No</b> Combine Separate: N/A Duration: N/A Preferred Date: N/A Exam Specifications: N/A
Final Exam	Yes/No: Yes Combine Separate: N/A Duration: N/A Exam Specifications: N/A



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COURSE OVERVIEW				
Week/ Lecture/ Module	Topics	Recommended/mandatory Readings	Module	Objectives/ Application
1	<ul style="list-style-type: none"> <li>▪ The climate and Earth systems</li> <li>▪ What is climate and what shapes it?               <ul style="list-style-type: none"> <li>▪ Planetary energy/radiative balance</li> <li>▪ Greenhouse effect</li> <li>▪ Direct and indirect climate feedback mechanisms (Earth's albedo)</li> <li>▪ Biosphere and energy budget</li> </ul> </li> <li>▪ Global variation in mean temperatures               <ul style="list-style-type: none"> <li>▪ Global distribution of major climate types based on latitudes and longitudes</li> <li>▪ Climatic zones in Pakistan</li> </ul> </li> </ul> <p><i>Self-assign a documentary listed in 'Homework Resources' section by Week 2 (or recommend your own): 10-minute presentations with 10 minutes of moderated debate will be held in Weeks 3-6.</i></p>	<p style="color: red; font-weight: bold;">Those marked with an asterisk (*) are short mandatory readings and must be read before each lecture. Readings/topics may be added/substituted as we go based on common student interests.</p> <p><b>Journal/news/report/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ *Loubere, P., 2012. The global climate system in <i>Nature Education Knowledge</i>. (<a href="#">link</a>)</li> </ul> <p><b>Booklet or book chapter(s):</b></p> <ul style="list-style-type: none"> <li>▪ "Climate literacy: The essential principles of climate science" (<a href="#">link</a>)</li> <li>▪ "The CO2 greenhouse effect", in Spencer Weart's textbook (<a href="#">link</a>)</li> <li>▪ Chapter 7 of AR6: The Physical Science Basis by IPCC. (<a href="#">link</a>)</li> <li>▪ Chapter 2 in Robert May's textbook</li> </ul>	Foundations of climate science and climate change	Develop a scientific framework in students' minds for thinking about climate change
	<ul style="list-style-type: none"> <li>▪ What is climate change?               <ul style="list-style-type: none"> <li>▪ Climatic variation within our lifespan (seasonal and decadal variation)</li> <li>▪ Climatic variation since the advent of mankind (paleoclimate: glacial and interglacial periods)</li> <li>▪ Climate and geological time (Cenozoic and phanerozoic climates)</li> </ul> </li> <li>▪ Abrupt climate change: Issue that we now face               <ul style="list-style-type: none"> <li>▪ Greenhouse gases (H<sub>2</sub>O, CO<sub>2</sub>, CH<sub>4</sub>, O<sub>3</sub>, NO<sub>x</sub>)</li> <li>▪ Anthropogenic aggravation of the greenhouse effect: Fossil fuels, Land-use change, ozone depletion, etc.</li> <li>▪ Natural causes (volcanoes, solar output)</li> </ul> </li> <li>▪ The concept of carbon footprint</li> </ul>	<p><b>Online visual resources:</b></p> <p>"Energy balance: The simplest climate model" by Ballantyne and Clark (<a href="#">link</a>)</p> <p>"Climate at a Glance" by NOAA National Centres for Environmental information (<a href="#">link</a>)</p> <p><b>Journal/news/report/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ *"What is climate change? A really simple guide" in BBC News (<a href="#">link</a>)</li> <li>▪ "The Climate System: An Overview" by IPCC (<a href="#">link</a>)</li> </ul> <p><b>Book chapter(s):</b></p> <ul style="list-style-type: none"> <li>▪ Chapter 1 in Robert May's textbook</li> <li>▪ Chapter 2 in Robert May's textbook</li> </ul>		



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2	<ul style="list-style-type: none"> <li>▪ Climate change and the lithosphere</li> <li>▪ Climate change and the atmosphere</li> <li>▪ Climate change and the hydrosphere</li> <li>▪ Climate change and the cryosphere</li> <li>▪ Climate change and the biosphere</li> </ul>	<p><b>Journal/news/report/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ <b>**</b>"The Climate System: An Overview" by IPCC (<a href="#">link</a>)</li> </ul> <p><b>Book chapter(s):</b></p> <ul style="list-style-type: none"> <li>▪ Chapter 4, 5, and 6 in Robert May's textbook</li> <li>▪ Chapter "Aerosols: Volcanoes, dust, clouds" in Spencer Weart's textbook (<a href="#">link</a>)</li> </ul>		
	<ul style="list-style-type: none"> <li>▪ Global and regional consequences of climate change               <ul style="list-style-type: none"> <li>▪ Decline in biodiversity</li> <li>▪ Loss of freshwater resources</li> <li>▪ Ocean imbalance and sea-level rise</li> <li>▪ Food security and food production</li> <li>▪ Etc.</li> </ul> </li> <li>▪ Global attempts at adaptation</li> </ul>	<p><b>Journal/news/report/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ <b>**</b>"The effects of climate change" – A NASA article (<a href="#">link</a>)</li> </ul> <p><b>Online visual resources:</b></p> <p style="padding-left: 20px;"><a href="#">Video link</a></p> <p><b>Book chapter(s):</b></p> <ul style="list-style-type: none"> <li>▪ Chapter 1 by Wolfson and Schneider (<a href="#">link</a>)</li> <li>▪ Chapter 7 in in Robert May's textbook</li> <li>▪ Chapters 5, 8, 9, and 11 of the AR6 by IPCC</li> <li>▪ <b>**</b>"Climate Change 2014: Impacts, adaptation, and vulnerability" - A summary for policy makers by IPCC (<a href="#">link</a>)</li> <li>▪ "Impacts of Climate Change" in Spencer Weart's textbook (<a href="#">link</a>)</li> </ul>		
3	<p><b><i>Graded student presentations from documentaries: Compile 3-4 minutes of moments of the documentary the spoke to you the most; present the main messages of the entire documentary in a total of 10 minutes, followed by 10 minutes of moderated debate.</i></b></p>	<p><b><i>Documentaries being presented by your peers must be watched before class. Post-presentation debate will be graded.</i></b></p>		<p>Describe the evolution of climate change as a global issue and international laws introduced to tackle it</p>



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	<ul style="list-style-type: none"> <li>▪ Environmental ethics, responsibility, and optimism               <ul style="list-style-type: none"> <li>▪ Gaia hypothesis</li> <li>▪ “Common but differentiated responsibilities”</li> <li>▪ CFCs &amp; saving the ozone as an example of a success story</li> <li>▪ Key environmental thinkers/activists</li> </ul> </li> <li>▪ Key organisations and events and their timelines               <ul style="list-style-type: none"> <li>▪ United Nations, role, working, and structure</li> <li>▪ The United Nations Framework Convention on Climate Change (UNFCCC)</li> <li>▪ International Panel on Climate Change (IPCC)</li> </ul> </li> <li>▪ International civil society organisations</li> <li>▪ International Energy Agency (<a href="#">link</a>)</li> <li>▪ Pakistani civil society and governmental organisations for the environment</li> </ul>	<p><b>Journal/news/reports/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ Wold et al., 2009 in Climate Change and the Law. (<a href="#">link</a>)</li> <li>▪ **“Analysis: Which countries are historically responsible for climate change?” by Simon Evans (<a href="#">link</a>)</li> <li>▪ **“Explainer: Why ‘differentiation’ is key to unlocking Paris climate deal” in Carbon Brief (<a href="#">link</a>)</li> </ul> <p><b>Book chapter(s):</b></p> <ul style="list-style-type: none"> <li>▪ Chapters 8 and 9 in Robert May’s textbook</li> <li>▪ **“Timelines (Milestones” in Spencer Weart’s textbook (<a href="#">link</a>)</li> </ul>	International legislation and collaboration	
	<p><b>Graded student presentations from documentaries: Compile 3-4 minutes of moments of the documentary the spoke to you the most; present the main messages of the entire documentary in a total of 10 minutes, followed by 10 minutes of moderated debate.</b></p>	<p><b>Documentaries being presented by your peers must be watched before class. Post-presentation debate will be graded.</b></p>		
4	<ul style="list-style-type: none"> <li>▪ Global scientific and political consensus on climate change               <ul style="list-style-type: none"> <li>▪ Seminal documents and events and agreements regarding climate change</li> </ul> </li> <li>▪ Details of the UN Framework Convention on Climate Change (UNFCCC)</li> <li>▪ Kyoto Protocol and other protocols</li> <li>▪ The Paris Agreement and Next Steps</li> </ul>	<p><b>Journal/news/reports/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ The Brundtland Report (1987): “Our Common Future” (<a href="#">link</a>)</li> <li>▪ “The Future We Want” – RIO+20 (<a href="#">link</a>)</li> <li>▪ Final text of the “UNFCCC” (<a href="#">link</a>)</li> <li>▪ Final text of the “Paris Agreement” (<a href="#">link</a>)</li> <li>▪ **“Analysis: The Final Paris Climate deal” by Carbon Brief (<a href="#">link</a>)</li> <li>▪ **“Ten Inconvenient Truths About the Paris Climate Accord” by Surya Sethi (<a href="#">link</a>)</li> <li>▪ “Five myths about the Paris climate agreement” by Paul Bledsoe (<a href="#">link</a>)</li> <li>▪ **“The Paris Climate Agreement: Historic Breakthrough in Spite of Shortcomings” by Meinhard Doelle (<a href="#">link</a>)</li> <li>▪ Manguiat and Raine, 2018. Strengthening National Legal Frameworks to Implement the Paris Agreement in <i>Carbon &amp; Climate Law Review</i> (<a href="#">link</a>)</li> </ul>	Global goals	<p>Describe international efforts to face climate change and other issues arising from it and with it by encouraging national and individual actions</p>



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5	<p><i>Graded student presentations from documentaries: Compile 3-4 minutes of moments of the documentary the spoke to you the most; present the main messages of the entire documentary in a total of 10 minutes, followed by 10 minutes of moderated debate.</i></p> <ul style="list-style-type: none"> <li>▪ Millennium Development Goals and their success</li> <li>▪ Sustainable Development Goals</li> <li>▪ What do we owe to the future generations?</li> </ul>	<p><b>Documentaries being presented by your peers must be watched before class. Post-presentation debate will be graded.</b></p> <p><b>Journal/news/reports/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ “Transforming our world: The 2030 Agenda for Sustainable Development” (<a href="#">link</a>)</li> <li>▪ *”Take Action for the Sustainable Development Goals” by the UN (<a href="#">link</a>)</li> <li>▪ *Robert et al., 2005 in <i>Environment: Science and Policy for Sustainable Development</i></li> </ul> <p><b>Book chapter(s):</b></p> <ul style="list-style-type: none"> <li>▪ “Climate change, sustainable development and the clean development mechanism” by Orellana (<a href="#">link</a>)</li> </ul>		
6	<p><i>Graded student presentations from documentaries: Compile 3-4 minutes of moments of the documentary the spoke to you the most; present the main messages of the entire documentary in a total of 10 minutes, followed by 10 minutes of moderated debate.</i></p> <ul style="list-style-type: none"> <li>▪ The global energy infrastructure             <ul style="list-style-type: none"> <li>▪ GHG emissions from fossil fuels</li> <li>▪ Carbon sequestration, biofuels, hydrogen, geoengineering</li> <li>▪ Green energy generation</li> </ul> </li> </ul> <p><b>Non-graded class activity: Sankey diagrams.</b></p> <p><b>Graded HW assignment: ≤300 essay on “Is climate change a problem created by the privileged world?” Due in Week 8.</b></p>	<p><b>Documentaries being presented by your peers must be watched before class. Post-presentation debate will be graded.</b></p> <p><b>Journal/news/reports/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ *”Fossil fuel industry gets subsidies of \$11m a minute, IMF finds” by Damian Carrington (<a href="#">link</a>)</li> <li>▪ *”World is ‘doubling down’ on fossil fuels despite climate crisis – UN report” by Damian Carrington (<a href="#">link</a>)</li> <li>▪ *”Invisible killer’: fossil fuels caused 8.7m deaths globally in 2018, research finds” by Oliver Milman (<a href="#">link</a>)</li> </ul> <p><b>Online visualisation resources:</b></p> <ul style="list-style-type: none"> <li>▪ IEA Sankey Diagrams (<a href="#">link</a>)</li> </ul>	National efforts to tackle climate change	Investigate fossil fuel consumption as a major contributor to climate change and national efforts to mitigate it



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7	<ul style="list-style-type: none"> <li>▪ (Intended) Nationally determined contributions (INDCs)</li> <li>▪ Indicators of SDG success by the World Bank</li> <li>▪ Excellency speeches at 76<sup>th</sup> UNGA 2021</li> <li>▪ Conference of the Parties (COP) and major outcomes</li> </ul> <p><i>Non-graded class activity: Explore Pakistan's INDC and evaluate the steps taken for it; compare with a country of choice using the "INDC Detailed View"</i></p> <p><i>Graded activity: COP simulation</i></p>	<p><b>Journal/news/reports/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ <b>*</b>"Nationally Determined Contributions (NDCs)" by the UNFCCC (<a href="#">link</a>)</li> <li>▪ <b>*</b>"National Climate Action under the Paris Agreement" by the World Resources Institute (<a href="#">link</a>)</li> </ul> <p><b>Online visualisation resources:</b></p> <ul style="list-style-type: none"> <li>▪ CAIT Climate Data Explorer to track INDCs (<a href="#">link</a>)</li> <li>▪ Climate action tracker (<a href="#">link</a>)</li> </ul>		
		TBA		
8	<ul style="list-style-type: none"> <li>▪ <b>Guest panel</b></li> <li><b>Theme:</b> Undergraduate and graduate students who attended the COP26 (Panel of Pakistani and non-Pakistani students)</li> </ul> <ul style="list-style-type: none"> <li>▪ Climate change in the developing world</li> <li>▪ Climate change in Pakistan</li> <li>▪ Climate change in the developed world               <ul style="list-style-type: none"> <li>▪ Endangered Species Act</li> <li>▪ Clean Water Act</li> </ul> </li> <li>▪ Role of non-governmental organizations and corporate initiatives</li> <li>▪ Voluntary commitments and actions</li> <li>▪ Social cost of carbon</li> </ul>	<p style="text-align: center;">N/A</p> <p><b>Journal/news/reports/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ "Climate Risk Country Profile: Pakistan" by the Asian Development Bank and World Bank Group (<a href="#">link</a>)</li> <li>▪ Farooqi et al., 2005 in <i>Pakistan Journal of Meteorology</i> (<a href="#">link</a>)</li> <li>▪ Chinowsky et al., 2011 in <i>The Engineering Project Organisation Journal</i> (<a href="#">link</a>)</li> <li>▪ Wijaya, 2013 in <i>International Conferences on Geological, Geographical, Aerospace and Earth Sciences</i> (<a href="#">link</a>)</li> <li>▪ <b>*</b>"Climate change and the global economy: regional effects" by Keith Wade (<a href="#">link</a>)</li> <li>▪ <b>*</b>"Unprecedented Impacts of Climate Change Disproportionately Burdening Developing Countries, Delegate Stresses, as Second Committee Concludes General Debate" (<a href="#">link</a>)</li> </ul>		



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9	<ul style="list-style-type: none"> <li>▪ Climate change: Beliefs, religious and cultural cognition</li> <li>▪ Societal understanding of climate issues</li> <li>▪ The politics, economics, and philosophy of climate science (in underdeveloped regions of the world)</li> <li>▪ Climate and culture; climate and gender (women at the forefront of suffering and fighting); Fossil fuels and renewable energy</li> </ul> <p><b>Graded HW assignment: Interview family members, acquaintances, employees etc. from different generations and perceived social classes to gauge their understanding of climate change and their individual responsibilities. Report due in Week 12 (≤ 500 words).</b></p> <p><b>Graded HW assignment: Using the above, comment in a ≤300 word essay if and how much is multilingualism important to tackle climate change in Pakistan. Due in Week 12</b></p>	<p><b>Journal/news/reports/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ Climate literacy graph for the US (<a href="#">link</a>)</li> <li>▪ Braman et al., 2010 in <i>Journal of Risk Research</i> (<a href="#">link</a>)</li> </ul> <p><b>Book chapter(s):</b></p> <ul style="list-style-type: none"> <li>▪ “The public and climate” in Spencer Weart (<a href="#">link</a>)</li> </ul>	Ethics of climate change	Explore the social and philosophical aspects of climate science to understand individual, collective, and corporate responsibilities
	<ul style="list-style-type: none"> <li>▪ Human rights and climate change</li> <li>▪ Adaptation and mitigation</li> <li>▪ Pakistani initiatives</li> </ul>	<p><b>Journal/news/reports/web article(s):</b></p> <ul style="list-style-type: none"> <li>▪ Knox, 2014 in Oxford Handbook of International Climate Change Law (<a href="#">link</a>)</li> <li>▪ “Review of Current and Planned Adaptation Action in Pakistan” by Jo-Allan Parry (<a href="#">link</a>)</li> <li>▪ “National Climate change Policy in Pakistan” (<a href="#">link</a>)</li> <li>▪ Mumtaz et al., 2018 in <i>Earth Systems and Environment</i> (<a href="#">link</a>)</li> <li>▪ *”Pakistan to develop National Adaptation Plan for climate change” (<a href="#">link</a>)</li> </ul>		
10	<p><b>Graded debate on individual, corporate, and governmental responsibilities in meeting the Paris Agreement or in adapting to climate vulnerability</b></p>	<p><b>Book chapter(s):</b></p> <ul style="list-style-type: none"> <li>▪ “The Climate War” by Michael E Mann</li> </ul>		Gain lessons from experienced researchers regarding their personal and professional experiences in understanding and stepping
	<ul style="list-style-type: none"> <li>▪ <b>Guest lecture</b> <b>Theme:</b> Climate modelling: Past and future projections</li> </ul>	<p><b>Book chapter(s):</b></p> <ul style="list-style-type: none"> <li>▪ “Simple models of climate change” in Spencer Weart’s textbook (<a href="#">link</a>)</li> </ul>		
11	<ul style="list-style-type: none"> <li>▪ <b>Field visit</b> Visit to the MoCC or other facility, such as meteorology centre or SUPARCO</li> </ul>	N/A		





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	<ul style="list-style-type: none"> <li>▪ <b>Guest lecture</b> <b>Theme:</b> Climate legislation and implementation</li> </ul>		Social and economic aspects of climate change	up to the challenge and applying the lessons thus learned in a local scenario of climate adaptation and mitigation
12	<ul style="list-style-type: none"> <li>▪ <b>Guest lecture</b> <b>Theme:</b> Citizen science and climate change adaptation and mitigation</li> </ul>	<b>Journal/news/reports/web article(s):</b> <ul style="list-style-type: none"> <li>▪ *Fritz et al., 2019 in Nature Sustainability (<a href="#">link</a>)</li> <li>▪ “Analysis: The lack of diversity in climate-science research” by Ayesha Tandon (<a href="#">link</a>)</li> </ul>		
	<ul style="list-style-type: none"> <li>▪ Climate communication <i>Graded HW assignment: In ≤300 words, propose a simple means of conveying the climate change crisis to Pakistani masses. Keep COVID19 publicity in mind, i.e., ATM machine screens, phone messages, mass texts, TV advertisements, road banners, etc. Due in Week 14</i></li> </ul>	Various online resources		
13	<ul style="list-style-type: none"> <li>▪ <b>Guest lecture</b> <b>Theme:</b> Necessity of bringing laboratory research findings to mainstream media to promote efforts against climate change</li> </ul>	N/A		
	<ul style="list-style-type: none"> <li>▪ <b>Guest lecture</b> <b>Theme:</b> Application of nature-based solutions to climate change</li> </ul>	N/A		
14	<ul style="list-style-type: none"> <li>▪ <b>Guest lecture</b> <b>Theme:</b> Climate change economics</li> </ul>	<b>Journal/news/reports/web article(s):</b> <ul style="list-style-type: none"> <li>▪ “What is climate finance?” (<a href="#">link</a>)</li> </ul>		
	<ul style="list-style-type: none"> <li>▪ <b>Guest lecture</b> <b>Theme:</b> Role and current steps universities are taking within and outside Pakistan to counter climate change</li> </ul>	<b>Journal/news/reports/web article(s):</b> <ul style="list-style-type: none"> <li>▪ *”Cambridge University to divest from fossil fuels by 2030” by Matthew Taylor (<a href="#">link</a>)</li> </ul>		
15	<ul style="list-style-type: none"> <li>▪ <b>Guest Panel and Students:</b> The Deans/Chair (2-3) of Schools in LUMS <b>Theme:</b> Student present ideas on what can LUMS do to counter Climate Change now and in the future.</li> </ul>	N/A		
	<p><i>Final Exam</i></p>			



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### HOMEWORK RESOURCES

	Title	Director/Documentarian	Theme
<b>Documentaries</b>	Meltdown (2021)	Fredric Goldring	Arctic melting
	2040 (2019)	Damon Gameau	A look into the future based on our actions and inactions regarding climate change
	Lowland Kids (2019)	Sandra Winther	Sea level rise and climate refuge
	Thank You for the Rain (2017)	Julia Dahr	Environmental politics in developed world and example of individual efforts
	An Inconvenient Sequel (2017) <b>Note: The first part was released in 2006 and is listed below</b>	Bonni Cohen; Jon Shenk	Raising awareness in the public regarding climate change
	The Age of Consequences	Jared Scott	Climate change as a cause of displacement and resource scarcity
	Gasland (2016)	Josh Fox	The complexity of environmental change
	How to Let Go of the World and Love All the Things Climate Can't Change (2016)	Josh Fox	Global climate change activism
	Antarctica: Ice and Sky (2015)	Luc Jacquet	Field science in Antarctica
	Cowspiracy: The Sustainability Secret (2014)		The influence of ranches and cattle farming on the climate
	The Merchants of Doubt (2014)	Robert Kenner	Environmental politics and creation of scepticism against climate change
	More than Honey (2013)	Markus Imhoof	The significance of bees (biodiversity in general) in our ecosystem
	Inconsistent Truth (2012)	Shayne Edwards	Scepticism against climate change
	Revolution (2012)	Rob Stewart	The ways in which people can deal with climate change
	Chasing Ice (2012)	James Balog	Melting ice of the poles
	The Island President (2011)	Jon Shenk	Environmental politics
	The Age of Stupid (2009)	Franny Armstrong	Climate change in the future
	The 11 <sup>th</sup> Hour (2007)	Nadia Connors, Leila Connors	Emphasis on the need to counter climate change
	The Great Warming (2006)	Michael Taylor	Effect of climate change on public and cultures
An Inconvenient Truth (2006) <b>Note: The sequel was released in 2017 and listed above</b>	Davis Guggenheim	Raising awareness in the public regarding climate change	

### TEXTBOOK/SUPPLEMENTARY READINGS

#### Mandatory readings

- “The Discovery of Global Warming” by Spencer Weart ([link to online book](#))
- “The Britannica Guide to Climate Change: An Unbiased Guide to the Key Issue of Our Age” with introduction by Robert M May
- Select chapters of “The New Climate War: The Fight to Take Back Our Planet” by Michael E Mann

#### Optional readings

Numerous optional readings are mentioned in the course outline.

- “Introduction to Climate Science” by Andreas Schmittner ([link to online book](#))

#### Optional/recommended MOOCs

- Denial101: <https://skepticalscience.com/denial101x-videos-and-references.html>
- Climate Model of Middle Earth: <https://www.youtube.com/watch?v=jJNkd5g6oxI>; <https://www.youtube.com/watch?v=sRS1ptPOF54>; <https://www.youtube.com/watch?v=jJNkd5g6oxI> (As part of the denial)



## Lahore University of Management Sciences

### COURSE AND UNIVERSITY POLICIES

**Cell phone and electronic equipment:** Cell phones can be brought to class. They must always be placed clearly visible in front of the student on their desk/chair. Texting in class will not be tolerated and will warrant dismissal from the lecture. There will be need for the use of technology during this course, and it will be monitored during those instances.

**Code of conduct for class participation:** Come to class prepared and on time. Tardiness will be unacceptable. Have mandatory readings completed and questions in mind for discussion or clarification. Ask questions in class. Be attentive, respectful, and engaged with the guest lecturers and site-visit hosts. These are often very busy professionals and community leaders who are doing us an honour by meeting with us and deserve your full attention and respect. Discussions should be open and respectful of all viewpoints. Constructive and polite criticism and debate is encouraged during class.

**Code of conduct for group work with peers:** Respect differences of opinion. You will not agree with everything you hear, but you are expected to listen regardless of difference in opinion. Consider others perspectives with respect even if you disagree. Be proactive and flexible and take ownership of your learning experience as individuals and as a group.

**Special accommodations:** Students with disabilities who need special accommodations for this class are encouraged to meet with the instructor or the appropriate disability service provider on campus as soon as possible. Students will not be provided with any special accommodations for academic work completed prior to disclosure of the disability or the completion of the documentation process with the appropriate authorities.

**Academic honesty:** All students are expected to read assigned material, seek, and share additional resources, participate in class discussions based on readings and other resources. Students are encouraged to consult any relevant resources, especially those that provide critiques or contrasting views, and to share their personal experience and expertise with the class. Assignments may be individual or group. In case of individual assignments, all academic work will be done by the student to whom it is assigned without unauthorized aid of any kind. Plagiarism, cheating, and other forms of academic dishonesty are prohibited. For further information, students should make themselves familiar with the relevant section of the LUMS student handbook.

**Harassment policy:** There will be zero tolerance for any behaviour that is intended or has the result of making anyone uncomfortable and negatively impacts the class environment or an individual's ability to work to the best of their potential. A strict action will be taken against those who breach the privacy of the students or the instructor.

To file a complaint, please write to [harassment@lums.edu.pk](mailto:harassment@lums.edu.pk)

**SSE Council on Equity and Belonging:** To seek counsel related to any issues, please feel free to approach either a member of the council or email at [cbe.sse@lums.edu.pk](mailto:cbe.sse@lums.edu.pk)