



School of Civil and Environmental Engineering (SCEE)
National University of Sciences & Technology



Course Title: Climate Change Adaptation & Mitigation

Course Code: ENS-827

Objectives:

The aim of the course is to give an understanding of climate change impacts, and provide the knowledge and tools to devise effective strategies for climate change adaptation and mitigation.

Outcome: After completion the students will be able to identify natural and anthropogenic drivers of climate change, have knowledge of the direct observations of climate change, and describe the impacts of climate change on agriculture, forestry, ecosystems, water resources, society and human health.

Course

Course outline

Introduction, types and their climatic effects, Modeling of climate change, types of climate change models, Climate Change and Wetlands: Impacts, Adaptation and Mitigation, Basic understanding of the physical science of climate change, Climate change impacts and the human response to climate change, Adaptation to climate change, Natural and anthropogenic drivers and direct observations of recent climate change, Potential adaptation strategies in different sectors, Climate change impacts and adaptation practices for ecosystems, land use, water resources, society and human health, Climate change mitigation strategies, Carbon sequestration, Transition to carbon neutral energy sources, Geo-engineering as well as measures to increase energy efficiency, Climate change policy and social change, International climate change negotiations, Regulatory instruments, Voluntary agreements and social change. Climate change and food production, climate change and its effects on Pakistan's agriculture, water resources, forests, etc.

Recommended Books

1. Adaptation to climate change / Mark Pelling. Abingdon, Oxon, England; New York Routledge, c2010. 9780415477505 (hardback)
2. Climate Change - Causes, Effects, and Solutions, 1st Edition, Hardy, J. T., John Wiley & Sons, 2003.
3. *Global Warming -The Complete Briefing* by John T. Houghton. (3rd edition) Cambridge University Press, 2004.
4. *Climate Impact and Adaptation Assessment A Guide to the IPCC Approach*, Earthscan Publication Ltd, London, 2005.
5. *Climate Change - Causes, Effects, and Solutions*, Hardy, J.T., John Wiley & Sons, 2003.
6. *The Green House Effect, Climate Change and Ecosystems*. Warrick, B & Jager, D. (Ed.). ECOPE 29. John Wiley & Sons. Chichester. UK 1991.
7. Botkin D. & Keller E., 2000. *Environmental Science: Earth as Living Planet*. 8th ed. John Wiley and Sons
8. Cunningham W.P., & Saigo, B.W., 2001. *Environmental Science*, 6th Ed. Mc-Graw Hill