

COURSE CODE: ENS-413
COURSE NAME: Climate Change
CREDIT HOURS: Theory = 3 Practical = 0 Total = 3
CONTACT HOURS: Theory = 48 Practical = 0 Total = 48
PREREQUISITE: None
MODE OF TEACHING: Three hours of lecture per week

COURSE DESCRIPTION:

The objective of this course is to provide a wide-ranging understanding on climate change, understanding climate system, being aware of the impacts of climate change on society, understanding of adaptation and mitigation options in relation to climate change.

TOPICS COVERED:

Week#	Topics
1	Defining Climate, Climate system
2	Components; controls on climate; Latitude
3	Earth-sun relationships, Revolution, Rotation, Axial tilt and their combined effect
4	Distance to large bodies of water, Climate change processes
5	Green House Gases' emission, Drivers and Indicators of Climate Change, Cause & Effect of Climate Change
6	Climate Change Policy, Impacts of Climate Change in Pakistan
7	Green Economy, Carbon Footprint, Technological Development and Changing climate
8	Climate Change matters, Present rapid warming, Projection of future climate change
9	Midterm Exam – MSE
10	Uncertainty in climate change projections, Climate change impacts-reasons for concern
11	Impacts on natural systems, societal systems, human health and comforts

12	Reactions and attitudes to climate change: Adaptation, Mitigation options
13	Increased energy efficiency, fuel substitution
14	Nuclear power, hydropower, solar energy
15	Biomass energy, wind power, tidal energy
16	Tidal, wave and geothermal energy
17	Hydrogen economy, changes in infrastructure and behavior
18	End Semester Exam

Text and Material:

1. William James Burroughs, Climate change: A Multidisciplinary Approach, Cambridge University Press, Cambridge, UK.
2. Changing Climate, Changing Worlds: Local Knowledge and the Challenges of Social and Ecological Change by Meredith Welch-Devine, Anne Sourdril and Brian J. Burke, Springer; 1st ed. 2020.
3. Introduction to Modern Climate Change by Andrew E. Dessler, Cambridge University Press; 3rd edition, 2021.

ASSESSMENT SYSTEM:

Theoretical/Instruction	100%
Assignments	10%
Quizzes	15%
Mid Semester Exam	25%
End Semester Exam	50%
Practical Work	0%
Lab Attendance	0%
Lab Report	0%
Lab Quiz	0%
Lab Rubrics	0%