



University of Kerala

Discipline	ZOOLOGY				
Course Code	UK2MDCZOO101				
Course Title	Global Climate Change				
Type of Course	MDC				
Semester	II				
Academic Level	100-199				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	3	3 hours	-	-	3
Pre-requisites	Pass in Class XII				
Course Summary	This course provides a comprehensive understanding of global climate change, covering its basic concepts, anthropogenic causes, and the greenhouse effect. It explores the impacts on ecosystems, weather patterns, and species, alongside management strategies such as national missions and environmental audits. International summits, agreements, and future climate projections, including modeling and GIS, are also discussed. Practical activities like identifying environmental indicators and conducting Green Audits enhance learning.				

Detailed Syllabus

Module	Unit	Content	45 hrs
I		Introduction to Global Climate Change	9
	1.1	Basic Concepts- Biosphere, Atmosphere, Weather, Climate, Climate Change.	2
	1.2	Global Climate change (Brief description): Biological Evidences (Examples: Reduction in Krill population of Arctic Ocean, Habitat loss of Asian Elephants). Indicator Organisms of Climate Change (examples)- Earthworm, The Ganges Dolphin, Sharks, Penguins and Tiger). Related Activities <i>Identification of environmental indicators in Climate change (eg: animals) and submission of reports (Lists/pictures).</i>	7
II		Causes of Climate Change	8
	2.1	Anthropogenic causes- Burning of fossil fuel, deforestation, urbanization, industry, agriculture and animal husbandry.	4
	2.2	Greenhouse effect: Greenhouse gases, sources, Global warming, depletion of ozone layer and consequences.	4
III		Impacts and Management measures of Global Climate Change	11

	3.1	Impacts of Climate Change: Rising Temperature, Sea level rise, Increased drought, Heat waves, Flooding, Cyclogenesis, Cloud burst, Water and Food scarcity, Health and economic issues, Animal extinction, Animal migration (Concept only). Global Environmental change issues and challenges - <i>El Nino, La Nina</i> .	4
	3.2	Preventive measures taken for Climate Change in India: The National Solar Mission, National Enhanced Energy Efficiency, The National Sustainable Habitat Mission, Green India Mission, EIA program, Energy Audit, Green Audit, Carbon footprint analysis (Brief description only). Related Activity: <i>Green Audit- Residence or Campus</i>	7
	International Summits and Agreements		10
	4.1	International Summits: BRICS, G20, G7, ASEAN, SAARC, Indian Science Congress, NATO. Earth Summit-Rio de Janeiro.	5
IV	4.2	International Agreements: The United Nations Framework Convention on Climate Change, UNFCCC, Kyoto Protocol, Paris Agreement. Swedish environmental activist contribution; Greta Thunberg (Brief account).	5
	Future Climate: Scenarios and Projections		7
V	5.1	Climate modelling, Climate change feedback, GIS, Role of INCOIS and IMD. (Brief account only). Related activities: <i>Preparation of Weather chart (Temperature/Rainfall) - Connect INCOIS, India Meteorological Department</i>	7

References

1. Adger, N.; Brown, K. and Conway, D. (2012). Global Environmental Change: Understanding the Human Dimensions. The National Academic Press.
2. Hester, R.E. and Harrison, R.M. (2002). Global Environmental Change. Royal Society of Chemistry.
3. Matthew, R.A.; Barnett, J. and McDonald, B. (2009). Global Environmental Change and Human Security. MIT Press., USA.
4. Turekian, K.K. (1996). Global Environmental Change-Past, Present, and Future. Prentice-Hall.

Web resources

- <https://incois.gov.in/>
- https://youtu.be/1cWwRPJik9s?si=DrNE-tVlM3bSF_1q
- <https://mausam.imd.gov.in/>
- <https://mausamjournal.imd.gov.in/index.php/MAUSAM>

Course Outcomes

No.	Upon completion of the course the graduate will be able to	Cognitive Level	PSO addressed
CO 1	Explain the basic concept of climate change and indicator organism	R,U	PSO-1,2
CO 2	Understand, recognize and evaluate various causes of climate change	R, U, E	PSO-1,2
CO 3	Identify various climate change issues, challenges and management of global climate change and prepare a green audit model of your campus	U,E, C, Ap	PSO-1,2
CO 4	Analyse and evaluate the activities of international summits	U, An,E	PSO-1,2
CO 5	Analyse the future climate scenarios and prepare a weather chart using INCOIS and IMD websites.	U, An, C	PSO-1,2

R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create

Name of the Course: Global Climate Change
Credits: 3:0:0 (Lecture: Tutorial: Practical)

CO No.	CO	PO/PSO	Cognitive Level	Knowledge Category	Lecture (L)/Tutorial (T)	Practical (P)
1	Explain the basic concept of climate change and indicator organism	PO 1/ PSO-1,2	R,U	F, C	L	-
2	Understand, recognize and evaluate various causes of climate change	PO 1, PO 2/ PSO1, PSO 2	R, U, E	F, P	L	--
3	Identify various climate change issues, challenges and management of global climate change and prepare a green audit model of your campus	PO2/ PSO1, PSO 2	U, E, C ,Ap	F	L	-
4	Analyse and evaluate the activities of international summits	PO1, PO2/ PSO1, PSO 2	U, An, E	F, C	L	-
5	Analyse the future climate scenarios and prepare a weather chart using INCOIS and IMD websites.	PO1, PO2/ PSO1, PSO 2	U, An, C	F	L	-

**F-Factual, C- Conceptual, P-Procedural, M-Metacognitive
Mapping of COs with PSOs and POs**

	PSO1	PSO 2	PSO 3	PSO4	PS O5	PSO 6	PO1	PO2	PO3	PO4	PO5	PO6	PO 7
CO 1	3	2	-	-	-	-	2	-	-	-	-	-	-
CO 2	2	3	-	-	-	-	2	3	-	-	-	-	-
CO 3	1	1	-	-	-	-	-	1	-	-	-	-	-
CO 4	2	2	-	-	-	-	1	2	-	-	-	-	-
CO 5	3	1	-	-	-	-	3	2	-	-	-	-	-

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:**Assignment/ Seminar topics**

1. Group discussions on the pros and cons of different international agreements in climate change mitigation.
2. Global warming and Greenhouse effect
3. Ozone layer depletion
4. Green Audit
5. Green House Effect
6. Kyoto protocol
7. Greta Thunberg
8. Paris Agreement
9. G 20
10. INCOIS and IMD

Continuous Comprehensive Assessment

1. Assignments
2. Seminar
3. Submission of Green audit report
4. Submission of Activity report
5. Test
6. Quiz/Debate

End Semester Evaluation

1. Multiple Choice Questions
2. Very Short Answer Questions
3. Short Answer Questions
4. Essay Type Questions

Mapping of COs to Assessment Rubrics

	Internal Exam	Assignment	Project Evaluation	End Semester Examinations
CO 1	✓	✓		✓
CO 2	✓	✓		✓
CO 3	✓	✓		✓
CO 4	✓	✓		✓
CO 5	✓	✓		