



**SARVAJANIK
UNIVERSITY**

INCLUSIVE | INTEGRATED | INNOVATIVE

SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology
Civil Engineering



B. Tech. IV Semester VII

Subject Name : Fundamentals of Climate Change

Subject Code: BTCL15701

Type of course : OE-III

Prerequisite : Environment Science (BTMD17102)

Rationale : To equip students for understanding of the environmental and climate change dimensions of development trends and interventions.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	0	3	60	25	15	-	-	100

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1.	Earth's Climate System: Introduction to environment, Ozone, ozone layer and its functions, Ozone depletion and ozone hole, Vienna convention and Montreal protocol, Greenhouse gases and greenhouse effect, Hydrological cycle and Carbon cycle, Global warming and its impacts, Climate Forcers	6	11%
2.	Atmosphere and Its Components: Atmosphere and its layers, Characteristics of Atmosphere, Structure of Atmosphere, Composition of Atmosphere, Atmospheric stability, Temperature profile of the atmosphere, Temperature inversion and effects of inversion on pollution dispersion	6	11%
3.	Climate Change and Its Causes: Climate change and Carbon credits, Clean Development Mechanism (CDM), CDM in India, Kyoto Protocol, Intergovernmental Panel on Climate Change (IPCC), Climate Sensitivity, Montreal Protocol, United Nations Framework Convention on Climate Change (UNFCCC), Global change in temperature and climate and changes within India	11	26%
4.	Impacts of Climate Change: Causes of Climate change, Change of Temperature in the environment, Melting of ice and sea level rise, Impacts of Climate Change on various sectors, Projected impacts for different regions, Uncertainties in the projected impacts and risk of irreversible changes.	11	26%

OE-III: Open Elective-III

W.e.f. AY 2021-22





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5.	Climate Change Mitigation Measures: CDM and Carbon Trading, Clean Technology, biodiesel, compost, biodegradable plastics, Renewable energy usage as an alternative, Mitigation Technologies and Practices within India and around the world, Non-renewable energy supply to all sectors, Carbon sequestration, International and regional cooperation for waste disposal biomedical wastes, hazardous wastes, e-wastes, industrial wastes, etc.,	11	26%
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Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
35	35	10	10	5	5

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels (**Revised Bloom's Taxonomy**)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Climate change: Critical Concepts in the environment	Frank Chambers, Michael Ogle	Routledge	2002	1 st
2	Global Warming- A very short introduction	Mark Maslin	Oxford publication	2009	2 nd
3	Climate Change and Sustainable Development: Prospects for Developing Countries	Anil Markandya	Routledge	2002	1 st
4	Climate Change Policy - Facts, Issues and Analysis	Jepma, C. J., and Munasinghe, M.	Cambridge University Press	1998	-
5	IPCC Fourth Assessment Report	-	Cambridge University Press, Cambridge, UK	-	-
6	Climate change: Causes, Effects and Solutions	John T. Hardy	Wiley publication	2003	1 st
7	Climate Change- A very short introduction	Mark Maslin	Oxford publication	2014	3 rd
8	Climate Change –An Indian Perspective	Dash Sushil Kumar	Cambridge University Press India Private limited	2007	-
9	Global Warming: Understanding the Forecast	David Archer	Wiley	2011	2 nd

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Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Describe earth's climate system containing the environment. (R, U....cognitive level)	15
CO-2	Discuss the atmosphere and its components with its temperature profile and effects on climate change. (R, U, A....cognitive level)	15
CO-3	Discover the causes and impacts of climate change for different regions. (R, U, A, N....cognitive level)	10
CO-4	Elaborate the changes in climate, carbon credit, and clean development mechanism with respect to different frameworks and policies of climate change. (R, U, A, N, E....cognitive level)	30
CO-5	Learn about the economics involved in mitigation methodologies, alternate sources of energy, and alternate methods of energy generation to reduce, utilized and disposed different types of waste. (R, U, A, N, E, C....cognitive level)	30

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	2	2	-	-	-	1	1	2	1	1	2	1	3	1	1
CO-2	1	1	-	-	1	-	3	1	1	2	2	3	3	1	3
CO-3	1	1	1	-	-	-	1	2	-	1	3	2	2	1	2
CO-4	1	1	1	1	1	2	3	1	1	2	2	3	3	1	3
CO-5	1	1	1	1	1	2	3	1	1	2	2	3	3	1	3
Rational e*	6	6	3	2	3	5	11	7	4	8	11	12	14	5	12

Rationale*: The study of fundamental aspects, effects and economics of different challenges of climate change will help to select various methods to identify the impacts and its mitigation.

List of Open Source/learning website:

- https://www.youtube.com/watch?v=zQi3C_eZkLs
o Introduction to climate change
- <https://www.youtube.com/watch?v=QcBbC1xbn58>
o Climate change and its science
- <https://www.youtube.com/watch?v=IpSbQRI99Oo>
o Climate change adaptation
- https://www.youtube.com/watch?v=I90q5WMD_TU
o Impacts of climate change
- <https://www.youtube.com/watch?v=DtVX1OQFmk>
o Climate change mitigation and way forward



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