COURSE TITLE	**CLIMATE CHANGE AND ITS MITIGATION**
COURSE CODE	**01OE0010**
COURSE CREDITS	**3**

Objective:

1 To comprehend the climate change, Earth's Climate System and the concept of adaptation and mitigation.

Course Outcomes: After completion of this course, student will be able to:

1 Understand the importance of atmospheric and climatic changes
2 Engage themselves towards bringing awareness on the cause and effect of climate change
3 Examine and critique policy issues related to climate change
4 Identify clean technologies for sustainable development

Pre-requisite of course: Basic of Environmental Studies

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Climate and Atmosphere** Definition of weather and climate; meteorology and climatology; Elements, Formation,, composition of Earth's atmosphere; mass and layering of atmosphere; Atmospheric stability; Temperature profile of the atmosphere; Lapse rates;, Temperature inversion; effects of inversion on pollution dispersion;, Basic climate groups: low latitude, mid-latitude, high latitude.	10
2	**Earth climate system and Climate change** The climate system; Earth's natural greenhouse Effect and Dark Heating;, radiation balance; enhanced greenhouse effect; climate forcing;, climate forcing agents- greenhouse gases, aerosols, clouds, land use etc.;, global warming; the runaway greenhouse effect, The Intergovernmental Panel on Climate Change (IPCC).	10
3	**Impacts of Climate Change** Change of temperature in the environment; melting of ice Pole; Sea level rise;, Impacts of Climate Change on various sectors:, sectors: Agriculture, Forestry and Ecosystem, Water Resources,, Human Health, Industry, Settlement and Society.	8

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Contents : Unit	Topics	Contact Hours
4	**Mitigation Approaches and Adaptation** Climate change and Carbon credits; Clean Development Mechanism;, Carbon Trading; Clean Technology; Mitigation Efforts in India;, Consumption Patterns and global climate Change; Adaptive capacity; adaptation to climate change;, Carbon sequestration; Long term and short-term mitigation options,, zero carbon future, Climate change preparedness.	12
Total Hours		**40**

Textbook :

1 Handbook of climate change mitigation and adaptation. Cham, Switzerland: , Chen, W. Y., Suzuki, T., & Lackner, M. (Eds.)., Springer International Publishing., 2017

2 Adaptation and mitigation strategies for climate change., Sumi, A., Fukushi, K., & Hiramatsu, A., New York, NY: Springer., 2010

References:

1 Climate Change Modeling, Mitigation, and Adaptation. , Climate Change Modeling, Mitigation, and Adaptation. , Zhang, T. C., Ojha, C. S. P., & Kao, C. M., American Society of Civil Engineers., 2013

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	30.00	25.00	15.00	10.00	0.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

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Supplementary Resources:

1 https://in.coursera.org/learn/climate-change-mitigation

2 http://yojana.gov.in/adaptation-and-mitigation.asp

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