

**M. Tech. II, Semester – III**

**Subject Name:** Energy, Climate Change And Urban Development      **Subject Code:** MTTC15301

**Type of course:** Open Elective

**Prerequisite:** Basic understanding of energy, climate and climate change issues and basic knowledge on fundamentals of sustainable development and its origin.

**Rationale:** The subject aims to create a better understanding climate change and context of sustainable development and urbanization process.

**Teaching and Examination Scheme:**

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	100
03	00	00	03	60	25	15	0	0	

**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	<b>Introduction</b> Energy, Climate change and Urban Development – Interface.	08	17
2	<b>Energy Generation and Consumption.</b> Energy Supply and Demand, Energy Consumption in cities, determinants of energy demand, phenomenon of climate change, factors influencing climate change, impacts of climate change	07	16
3	<b>Energy Planning and Management, and Mitigation and Adaptation to Climate Change.</b> Energy efficient development, Compact city form, Transit oriented development. Mechanisms and measures for	08	18

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	mitigating and adapting to climate change at various levels		
<b>4</b>	<b>Plans, Policies and Strategies.</b> Related to energy planning, conservation, climate change mitigation and adaptation.	10	23
<b>5</b>	<b>Sustainable Development – Introduction and scenario</b> Sustainable development, Origin, Rio Summit, Agenda 21 and significance, Scenario of globe, Scenario of India, Efforts in India and abroad, A case study of Indian and abroad, One each.	12	26

**Suggested Specification table with Marks (Theory/Practical):**

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
<b>20</b>	<b>30</b>	<b>20</b>	<b>10</b>	<b>10</b>	<b>10</b>

**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
01	AGENDA 21 Kindle Edition	by <u>Julian Chitta</u> (Author)	<ul style="list-style-type: none"> <li>ASIN : B007RDQI7M</li> <li>Kindle Edition Amazon</li> </ul>	2019	I
02	Environment and Sustainable Development Hardcover – 16 October 2013 (Editor)	by <u>M.H. Fulekar</u> (Editor), <u>Bhawan a Pathak</u> (Editor), <u>R K Kale</u>	<ul style="list-style-type: none"> <li>Publisher : Springer Nature;</li> <li>2014th edition (16 October</li> </ul>	2013	I

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			<ul style="list-style-type: none"> <li>• 2013)</li> <li>• Language : English</li> <li>• Hardcover : 198 pages</li> <li>• ISBN-10 : 8132211650</li> <li>• ISBN-13 : 978-8132211655</li> </ul>		
03	Climate Change Paperback – 7 May 2018	by <u>Joseph Romm</u> (Author)	<ul style="list-style-type: none"> <li>• Publisher : OUP US (7 May 2018)</li> <li>• Language : English</li> <li>• Paperback : 346 pages</li> <li>• ISBN-10 : 0190922435</li> <li>• ISBN-13 : 978-0190922436</li> </ul>	2018	I
04	The Great Derangement: Climate Change and the Unthinkable Paperback – 14 June 2019	by <u>Amitav Ghosh</u> (Author)	<ul style="list-style-type: none"> <li>• Publisher : Penguin (14 June 2019)</li> <li>• Language : English</li> <li>• Paperback : 284 pages</li> <li>• ISBN-10 : 014342906X</li> <li>• ISBN-13 : 978-0143429067</li> </ul>	2019	I

**Course Outcome:**

<b>Sr. No.</b>	<b>CO Statement After learning this subject, students will be able to</b>	<b>Marks % weightage</b>
<b>CO-1</b>	.....understand the basics of sustainable development and its origin. ( Level R, U, A )	20%
<b>CO-2</b>	.....understand Agenda 21 and its significance in environment conservation. ( Level R, U, A )	20%
<b>CO-3</b>	.....understand the issues of climate change and its significance for an engineer and for a planner as well. ( Level R, U, A )	25%
<b>CO-4</b>	.....analyze the current urbanization scenario of country and globe and its context to climate change. ( Level N, E,C )	15%
<b>CO-5</b>	.....propose a solution to conservation of environment in context to climate change. ( Level N, E,C )	20%

**LIST OF PRACTICALS:** (Minimum ----- performed.

1. Urbanization basics.
2. Sustainable development – History and context.
3. Agenda 21 and significance.
4. Green tree cover.
5. Open green space for urban area.

<b>Sr. No.</b>	<b>Link</b>	<b>Information / Details</b>
1.	<a href="https://swayam.gov.in/about">https://swayam.gov.in/about</a>	SWAYAM is a programme initiated by Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The objective of this effort is to take the best teaching learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy.
2.	<a href="https://www.worldbank.org/en/home">https://www.worldbank.org/en/home</a>	Official website of World Bank.
3.	<a href="https://olc.worldbank.org/">https://olc.worldbank.org/</a>	World Bank Open Learning Campus.
4.	<a href="https://www.worldbank.org/en/research">https://www.worldbank.org/en/research</a>	World Bank Research and publications.

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5.	<a href="https://openknowledge.worldbank.org/">https://openknowledge.worldbank.org/</a>	World Bank open knowledge repository.
6.	<a href="https://www.adb.org/who-we-are/about">https://www.adb.org/who-we-are/about</a>	The Asian Development Bank (ADB).
7.	<a href="https://www.adb.org/publications">https://www.adb.org/publications</a>	The Asian Development Bank (ADB). For any topic related to Planning. Extremely rich database and other publications.
8.	<a href="https://smartnet.niua.org/learn/library">https://smartnet.niua.org/learn/library</a> SmartCity Domain.	SMARTNET Library. Smartnet is an initiative of the Ministry of Housing and Urban Affairs to support the development of cities across India and to create a resource-rich ecosystem of learning, sharing and disseminating for city managers and primary stakeholders in the urban transformation of India.
9.	<a href="https://smartcities.gov.in/#block-habikon-content">https://smartcities.gov.in/#block-habikon-content</a>	Smart Cities Mission. Government of India.
10.	<a href="http://mohua.gov.in/upload/5c987f9e0fcecUTBook25March20191compressedcompressedcompressedmin11.pdf">http://mohua.gov.in/upload/5c987f9e0fcecUTBook25March20191compressedcompressedcompressedmin11.pdf</a>	Indian Ministry of Housing and Urban Affairs.
11.	<a href="http://mohua.gov.in/cms/annual-reports.php">http://mohua.gov.in/cms/annual-reports.php</a>	Indian Ministry of Housing and Urban Affairs. Rich complication of reports.
12.	<a href="https://data.gov.in/">https://data.gov.in/</a>	For any type of data of India, by Government of India.