

B.Tech	1	Semester	1/2	Teaching Scheme				Evaluation Scheme	
Subject Name	Energy & Environmental Engineering Lab			L	T	P	Credits	CCE	SEE
Subject Code	BTCH22102			-	-	2	1	25	25
Type of course	Engineering Science			CCE: Continuous and Comprehensive Evaluation SEE : Semester End Evaluation					
Prerequisite	No Prerequisite								
Rationale	This course designed to ignite awareness about local and global environmental issues and sensitizes youth for preservation of ecosystem and environment through adopting the concept of reduce, reuse and recycle in order to minimize human waste by proper energy management. Sustainability is a matter of environmental concern. Sustainable goals can only be achieved when proper application of all things is demonstrated in engineering, considering the environment and energy balance as a key factor.								

Course Outcomes (COs): At the end of the course, students will be able to	Marks % Weightage
CO – 1 Identify components of the environment and ecosystem.	15
CO – 2 Identify and explore different types of pollution & waste and delineate waste management and their sources.	25
CO – 3 Comprehend global environmental issues and SDGs.	10
CO – 4 Explore, compare, and contrast various energy sources and their impact on the environment and society.	20
CO – 5 Comprehend the need for energy management, and audit and energy conservation act.	15

List of Laboratory Practical	
1	Analysis of pH, Conductance and Turbidity of waste water
2	Proximate analysis of fuel.
3	Analysis of SO <sub>x</sub> , NO <sub>x</sub> and SPM in polluted air
4	Study of weather monitoring system.
5	Calorific value of fuel by Bomb Calorimeter
6	Analysis of CO <sub>2</sub> by Volumetric Titration Method.
7	Estimation of COD, BOD in polluted water sample.
8	Determination of Free residual chlorine in drinking water sample.

9	Measurement of Solar hours and irradiation
10	Study of Solar Thermal collector for steam conversion.
11	Study of Solar Photovoltaic (PV) panel and its V-I and P-V characteristics.
12	Study of Wind turbine for electricity generation.

**Recommended Reference Books**

- 1 C. N. Sawyer, E. L. Mcarty, Gene Perkin, Chemistry for Environmental Engineering and Science 5<sup>th</sup> edition, Publisher: Mcgraw Hill, 2017, ISBN – 9780070522441.
- 2 Miroslav Radojevic, Vladimir Bhaskin, Practical Environmental Analysis, Latest Edition, Publisher: Royal Society of Chemistry, 2006, ISBN - 978-0-85404-679-9.
- 3 Arthur I Vogel, Revised by Jeffery et al, Vogel's textbook of Quantitative Chemical Analysis, 5<sup>th</sup> edition, 1986, Publisher: Addison Wesley, Longman Ltd, ISBN- 0-582-44693-7.
- 4 APHA , Standard Methods for the Examination of water and waste water, 24<sup>th</sup> edition, Publisher: APHA, AWWA, WEF, 2024, ISBN-9780875532998.
- 5 G Lakshmi Swarajya, P Prabhu Prasadine, Environment Science A Practical Manual, 5<sup>th</sup> edition, Publisher: BS Publication, 2018, ISBN- 978-9389974720.

**CO-PO-Mapping**

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO-1	1	1	1	1	-	1	3	-	-	1	-	1
CO-2	2	1	1	1	-	1	3	-	-	1	-	1
CO-3	1	1	1	2	1	1	3	1	-	2	-	1
CO-4	2	2	2	1	1	2	3	1	-	1	-	1
CO-5	2	1	1	1	1	1	3	1	-	1	-	1

**List of Open Source/Learning website:**

- <https://nptel.ac.in/courses/127/106/127106004/>
  - It covers the Environment, Ecology and LCA for sustainability.
- <https://nptel.ac.in/noc/courses/noc19/SEM2/noc19-ge22/>
  - It covers basic of Environment and water, soil and noise pollution.
- <https://nptel.ac.in/courses/103/106/103106162/>
  - Its covers the basics of Environment analysis.
- <https://nptel.ac.in/courses/105/104/105104099/>
  - It covers the basics of Air pollution.
- <https://sdgs.un.org/goals/>
  - It covers the sustainable development goals.



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- [https://onlinecourses.swayam2.ac.in/cec21\\_ge08/preview](https://onlinecourses.swayam2.ac.in/cec21_ge08/preview)
  - It covers all types of pollution and its management.
- [https://onlinecourses.nptel.ac.in/noc20\\_ar01/preview](https://onlinecourses.nptel.ac.in/noc20_ar01/preview)
  - It covers the sustainable architecture designing of green buildings.
- <https://nptel.ac.in/courses/103103206>
  - It covers renewable energy engineering.
- [https://onlinecourses.nptel.ac.in/noc24\\_hs77/preview](https://onlinecourses.nptel.ac.in/noc24_hs77/preview)
  - It covers renewable energy economics.

