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Renewable Energy Technology — Complete Syllabus (Open Elective-02, Option A)

BTEUP Diploma in Civil Engineering • 6th Semester • Session 2026-27

Subject 6.3 (Open Elective-02, Option A) • 50 Marks Internal Only • 2 Credits • L 2 • Total NA — not counted in semester total • Choose this OR Energy Conservation and Audit (OR Advance Skill Development)

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
6.3	Open Elective-02: Renewable Energy Technology	Theory	2 - 0	2	50	—	NA
Open Elective-02 Total				2	50	—	NA

What This Subject Aims To Do

To understand the present and future scenario of world energy use, understand the fundamentals of solar energy systems, understand the basics of wind energy, understand bio-energy and its usage in different ways, and identify different available non-conventional energy sources.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction	5	20%
2	Solar Energy	6	20%

3	Wind Energy	5	20%
4	Bio-Energy	6	20%
5	Other Renewable Energy Sources	6	20%

Unit 1 — Introduction (5 Periods, 20%)

Topics: World energy use; reserves of energy resources; environmental aspects of energy utilisation; renewable energy scenario in India and around the world; potentials; achievements/applications; economics of renewable energy systems.

Unit 2 — Solar Energy (6 Periods, 20%)

Topics: Solar radiation; measurements of solar radiation; flat plate and concentrating collectors; solar direct thermal applications; solar thermal power generation; fundamentals of solar photo voltaic conversion; solar cells; solar PV power generation; solar PV applications.

Unit 3 — Wind Energy (5 Periods, 20%)

Topics: Wind data and energy estimation; types of wind energy systems; performance; site selection; details of wind turbine generator; safety and environmental aspects.

Unit 4 — Bio-Energy (6 Periods, 20%)

Topics: Biomass direct combustion; biomass gasifiers; biogas plants; digesters; ethanol production; bio diesel; cogeneration; biomass applications.

Unit 5 — Other Renewable Energy Sources (6 Periods, 20%)

Topics: Other renewable energy sources: tidal energy; wave energy; open and closed OTEC cycles; small hydro — geothermal energy; hydrogen and storage; fuel cell systems; hybrid systems.

Instead of This Elective — Advance Skill Development

The 6th-semester scheme allows an **Advance Skill Development** certification course to be taken **instead of** Open Elective-02. No course name is given for the 6th-semester option in the PDF (unlike the 5th semester, which names Advanced Plumbing, TATA TECH.). No detailed contents for this certification course are given in the PDF.

Reference Books (as listed in the syllabus)

- O.P. Gupta, Energy Technology, Khanna Publishing House, Delhi (ed. 2018).
- Renewable Energy Sources, Twidell, J.W. & Weir, A., EFN Spon Ltd., UK, 2006.
- Solar Energy, Sukhatme, S.P., Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
- Renewable Energy, Power for a Sustainable Future, Godfrey Boyle, Oxford University Press, U.K., 1996.
- Fundamental of Renewable Energy Sources, GN Tiwari and MK Ghoshal, Narosa, New Delhi, 2007.
- Renewable Energy and Environment — A Policy Analysis for India, NH Ravindranath, UK Rao, B Natarajan, P Monga, Tata McGraw Hill.
- Energy and The Environment, RA Ristinen and J J Kraushaar, Second Edition, John Willey & Sons, New York, 2006.
- Renewable Energy Resources, JW Twidell and AD Weir, ELBS, 2006.

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Source: BTEUP 3rd Year curriculum (folder2627), approved in C.D.C. meeting held on 16.07.2026. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text.

Please confirm with your own polytechnic for any local changes.

