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Solar Power Technologies — Complete Syllabus (Program Elective-3, Option 1)

BTEUP Diploma in Electrical Engineering • 5th Semester • Session 2026-27
Subject 5.2.1 (Program Elective-3, Theory) • Total 100 Marks • 3 Credits • L 3 - P 0 •
Choose this OR Electric Traction

Note: In the PDF the recommended-books list ends with a blank entry numbered “6.” — no sixth book is named, so it is not included here.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.2	Program Elective-3: Solar Power Technologies	Theory	3 - 0	3	40	60 (3 hrs)	100
Solar Power Technologies Total				3	40	60	100

What This Subject Aims To Do

To help students maintain the efficient operation of various types of solar power technologies.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
I	Solar Energy	06	14%
II	Concentrated Solar Power (CSP)	08	18%

III	Solar PV Panel and Installation	10	25%
IV	Solar PV Electronics	10	25%
V	Solar PV Off-grid and Grid Tied Systems	08	18%

Unit - I: Solar Energy (06 Periods, 14%)

Topics: Solar Map of India: Global solar power radiation; Different types of Solar water heaters: working and installation; Solar Heating systems, Different types of Solar cookers, Solar lighting.

Unit - II: Concentrated Solar Power (CSP) (08 Periods, 18%)

Topics: Concentrated Solar Power (CSP) plants or solar thermal electric systems; Parabolic Trough: working and specifications; Parabolic Dish: Construction, working and specifications; Power Tower, Fresnel Reflectors: Construction, working and specifications; Solar Stirling engines.

Unit - III: Solar PV Panel and Installation (10 Periods, 25%)

Topics: Types construction, working, Typical specifications of solar cells; Solar PV working principle: Series and parallel connections of solar modules; Solar Photovoltaic (PV) system: components layout and working; Solar modules, arrays and their standard specifications; Roof top and streetlight solar PV systems; Solar water pumping application.

Unit - IV: Solar PV Electronics (10 Periods, 25%)

Topics: Solar Charge controllers: working and specifications, switchgear and cables; Batteries: Different types for solar PV systems, Solar Inverters: working; Signal conditioning systems: working, Solar Power tracking: construction, working, I-V, P-V characteristics.

Unit - V: Solar PV Off-grid and Grid Tied Systems (08 Periods, 18%)

Topics: Solar off grid systems: Layout; Solar Grid tied (on grid) systems: Working principle of grid-tied dc-ac inverter, grid synchronization and active power export; Net metering: main features and working.

Reference Books (as listed in the syllabus)

- Solanki, Chetan Singh, - Solar Photovoltaics: Fundamentals, Technologies and Applications, PHI Learning, New Delhi, ISBN: 9788120351110
- Kothari, D.P. et al: Renewable Energy Sources and Emerging Technologies, PHI
- David M. Buchla, Thomas E. Kissell, Thomas L. Floyd, - Renewable Energy Systems, Pearson Education New Delhi, ISBN: 9789332586826
- Rachel, Sthuthi, Earnest, Joshua; - Wind Power Technologies, PHI Learning
- O.P. Gupta, Energy Technology, Khanna Publishing House, ISBN: 978-93-86173-683

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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.

