

INSTITUTIONAL OPEN ELECTIVE-II

GREEN TECHNOLOGY	
Course Code: CHOE02	Credits: 3:0:0
Pre – requisites: Engineering Chemistry	Contact Hours: 42L
Course Coordinator: Dr. Sagar J S	

Course Content

Unit I

Introduction: Green chemistry and technology for sustainable development, Environmental laws, Functions of CPCB and SPCB, carbon credits, environmental management system standards - ISO 14000 series.

- Pedagogy / Course delivery tools: Chalk and talk
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Unit II

Green Chemistry: Principles of Green Chemistry, Atom efficiency, Energy conservation, Waste minimization techniques, Substitution principle.

- Pedagogy / Course delivery tools: Chalk and talk
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Unit III

Life-Cycle Assessment: History, Process, life cycle stages, LCA Methodology, Streamlining LCA and Applications of LCA

- Pedagogy / Course delivery tools: Chalk and talk

Unit IV

Pollution Prevention Planning: Structure of the pollution prevention process, Environmental Audits, toxic release inventory.

- Pedagogy / Course delivery tools: Chalk and talk

Unit V

Design for the Environment: Design for X, improvement in manufacturing operations, design for disassembly / de manufacturing, packaging, case studies.

- Pedagogy / Course delivery tools: Chalk and talk

Text Books:

1. Paul L. Bishop, Pollution Prevention: Fundamentals and Practice, McGraw Hill, 2000.
2. Anastas P.T., Warner J.C., Green Chemistry: Theory and Practice. Oxford Science Publications, Oxford, 1998.

Reference Books:

1. Mike Lancaster, Green Chemistry- An Introductory Text, Royal Society of Chemistry Publishing, 2010
2. Boyle, Godfrey, Bob Everett, Janet Ramage, Energy Systems and Sustainability: Power for a Sustainable Future, Oxford University Press, 2004.

Course Outcomes (COs):

On successful completion of this course students will be able to

1. Explain environment laws, carbon credits, ISO 14000 series. (PO-1, 4, 6, 7, PSO-1)
2. Understand the principles of green chemistry. (PO-3, 4, 6,7, PSO-1)
3. Explain the importance of green technology in sustainable development. (PO-3, 4, 6,7, PSO-1)
4. Apply tools of green technology and life cycle assessment. (PO-3, 4, 6, 7, PSO-1)
5. Conduct pollution prevention planning and environment friendly design. (PO-3, 4, 6,7, PSO-1)

Course Assessment and Evaluation:

Continuous Internal Evaluation (CIE): 50 Marks		
Assessment tool	Marks	Course outcomes attained
Internal Test-I	30	CO1, CO2, CO3
Internal Test-II	30	CO3, CO4, CO5
Average of the two internal tests shall be taken for 30 marks.		
Other Components		
Assignment/Report	10	CO1, CO2, CO3
Case Study/Quiz	10	CO3, CO4, CO5
Semester-End Examination (SEE)	100 (Scale down to 50 Marks)	CO1, CO2, CO3, CO4, CO5