

PCE7J004

Green Technology

3-0-0

Module I:

Principles of green technology and engineering, Principles of atom and mass economy, E-factor.

Module II:

Design of greener and safer chemicals, Solvent-free methods: Microwave, Ultraviolet, and Solar. Green catalysts: ionic liquids, zeolites, photocatalyst, PEG, nanocatalyst, and biocatalyst. Green solvents: Supercritical fluids, fluoruous phase, and non-aqueous solvents.

Module III:

Scale-up effect, reactors, separators, Process intensification. Bio-conversion of renewables.

Reference Books:

1. Handbook of Green Chemistry, Vol. 1 to 9 by P T Anastas, Wiley VCH.
2. Green Chemistry and Engineering: A Practical Design Approach by C J González and D J C Constable, Wiley.
3. Green Chemistry and Engineering: A Pathway to Sustainability by A E Marteel- Parrish and M A Abraham, Wiley.
4. Green Chemistry for Environmental Sustainability by S K Sharma and AMudhoo, CRC Press.
5. Green Engineering: Environmentally Conscious Design of Chemical Processes by D T Allen and D R Shonnard, PHI.