

## **Faculty of Physical Sciences**

### **Green Chemistry and Technology**

#### **UNIT-I**

**Green Chemistry:** Introduction- Definition, Scope and need of green Chemistry, basic principles of green chemistry. Limitations /Obstacles in the pursuit the goals of the Green Chemistry and technology. Reasons for Green Chemistry (resource minimization, waste minimization concepts), Green synthesis: Evaluation of the type of the reaction i) Rearrangements (100% atom economic), ii) Addition reaction (100% atom economic).

#### **UNIT-II**

##### **Fundamentals of Catalytic Science and Engineering**

Homogenous and heterogeneous catalysis, Fundamentals of homogeneous catalysis mechanisms and kinetics, Acid--base catalysis, Transition metal catalysis. Green catalysts (Natural and Modified Clays, Zeolites, Ionic Liquids) and Bio catalysts (Enzymes).

#### **UNIT-III**

##### **Green Technology in Day to Day life & Industries:**

Implications of Green Technology in day to day life. Some of the case studies (including Dry Cleaning of cloths, Hydrogen peroxide as a bleaching agent, Green solution to turn turbid water clear) and different fields including Pharma & Polymer science (Paracetamol, Irbfen, polylactic acid, etc.), Organic electronics (such as OLED, Organic sensors, Green mobile phones, conductive paper), IT, Civil and Mechanical Engineering.

#### **UNIT-IV**

##### **Green Chemistry and its applications**

Microwave assisted reactions in water, Microwave assisted solid state reactions, Controlled Environmental Agriculture, Green house Technology, Effect of Various Parameters, Quality, Construction, Advantages and disadvantages of protected cultivation, Green chemistry in sustainable development.

##### **Reference books:**

1. Green Chemistry Theory and Practice. P.T.Anatas and J.C. Warner
2. V.K. Ahluwalia & M.R. Kidwai: New Trends in Green Chemistry, Anamalaya Publishers (2005).
3. Real world cases in Green Chemistry M.C. Cann and M.E. Connelly
4. Green Chemistry: Introductory Text M.Lancaster: Royal Society of Chemistry(London)