Certificate Course

in

Green Chemistry and Environmental Sustainability

Unit I – Introduction to Green Chemistry (6hrs)

Principles of green chemistry-atom economy calculation(simple reactions)-production of Ibuprofen-less hazardous chemical syntheses, designing safer chemicals-Bhopal gas tragedy-new greener syntheses, safer solvents andauxiliaries ionic liquids-super critical fluids CO2 and H2O, advantages of SCFs

Unit II – Green Chemistry Methods (6hrs)

Design for energy efficiency-principle of microwave oven, microwave assisted organic syntheses, Green chemistry practices in research, educational and commercial laboratories- lab safety signs- introduction to micro scale experiments

Unit III – Environmental Components (6hrs)

Structure and composition of the, Atmosphere, hydrosphere, biosphere and Lithosphere – composition of atmosphere, air pollution, water pollution and soil pollution.

Unit IV – Environmental disasters (6hrs)

Major environmental disasters - - mercury poisoning in Minamata, Japan ,Itaiitai disease due to cadmium poisoning in Japan - Love Canal toxic waste site, Seveso disaster chemical plant explosion - Bhopal disaster -Chernobyl incident.

Unit V – Environmental laws: (6hrs)

Environment (Protection Act) – The Air (Prevention and control of pollution) Act – The water (Prevention andcontrol of pollution) Act – The wild life protection Act – Forest conservation Act – The Ozone Depleting Substances (Regulation and Control) Rules – The Plastic Waste (Management and Handling) Rules - Riodeclaration- Montreal protocol, Kyoto protocol.

References:

1 M.M.Sreevastava and Rashmi Sanghi, Green Chemistry for environment, Narosa Publishing

House.

2. V.K.Ahluwalia, Green Chemistry, Enviornmentally Benign Reaction, Ane Book Pvt. Ltd.

3. Anastas. P.T.; Warner, J.C.,“Green Chemistry; Theory and Practice”, Oxford University Press; Oxford , U.K.,1998.

4. Lancaster,M,“Green Chemistry; An Introductory Text”,Royal Society of Chemistry; Cambridge,UK, 2003

5. Rashmi Sanghi and M.M Srivasthava, “Green Chemistry Environment Friendly Alternatives”, Narosa Publishing House,2006S. K. Banerji, “Environmental Chemistry”.

6. K. De “Environmental Chemistry - An introduction”

7. B. K. Sharma “Air Pollution”.

8. V. K. Ahluwalia “Environmental Chemistry”

9. G.W. vanLoon and S. J. Duffy “Environmental Chemistry: A global perspective”

10. S.K.Mohanty, Environment and Pollution Laws, Universal Law Publishing Co. Pvt Ltd.