

5. Jagbir Sing. Disaster Management: Future challenges and Opportunities, I.K. International.
- 6 Kulakarni, G. K. Implementation of occupational health legislation at work place – Issues and Concerns.
7. Paul R. Hunter. 1997. Waterborne disease: Epidemiology and Ecology, John Wiley and Sons Ltd., Chichester.
8. Peter H. Wald, Gregg M., Stave Proctor and Hughes. Physical and Biological Hazards of the work place.
9. Wisner, B. and Adams, J. 2002. Environmental Health in emergencies and disasters – A Practical Guide, World Health Organization.

SOFT CORE COURSES

ESS465 ADVANCED INSTRUMENTATION

39 hrs.

Course Outcomes:

CO1 Describe the principles and applications of instruments under spectroscopy, nephelometry, turbidometry and chromatography.

CO2 Understand the principles and applications of various instruments in the field of environmental science.

CO3 Get the knowledge of applications of instruments in environmental sample analysis.

CO4 Describe the applications of polarography in the environmental sample analysis.

CO5 Understand radio-chemical techniques.

UNIT I (13 hours)

Optical methods: Various ranges of electromagnetic radiations, interaction of electromagnetic radiation with matter, UV-Visible spectroscopy: Theory, instrumentation and applications to environmental samples, optical fibers in spectroscopy. X-ray fluorescence, X-ray diffraction.

UNIT II (13 hours)

IR and NDIR spectroscopy: Molecular vibrations and vibration frequencies, special features of IR and NDIR instruments, applications for the environmental samples. Continuous monitoring of CO using NDIR spectroscopy, Atomic Absorption Spectrophotometer: Principle, instrumentation and applications in environmental sample analysis. Atomic Emission Spectroscopy: Principle, instrumentation and applications of flame emission spectroscopy.

UNIT III (13 hours)

Nephelometry and turbidimetry: Principles and applications in the determination of turbidity of water. Thermoquality. Radio analytical methods: Radiochemical techniques - Principles and applications of neutron activation analysis and isotope dilution analysis. Polarography: Principles, instrumentation and applications of polarography in the environmental sample analysis. Solvent extraction, thin layer chromatography, gas chromatography, HPLC and Ion exchange chromatography.

References:

1. Bour, E.J. 1982. Introduction to Chemical Instrumentation, 4th Ed., Wiley & Sons.
2. Christian, G.D. 2001. Analytical Chemistry, 5th Ed., John Wiley and Sons Inc.,