CH-323 Chemical Safety & Risk Management

Credit Hours: 3-0

Pre-requisite: Nil

Course Objectives

1. The primary objective of this course is to equip students with comprehensive knowledge and practical understanding of chemical safety and risk management principles applicable to laboratory and industrial settings. The course emphasizes the identification of chemical hazards, effective risk assessment, implementation of safety protocols, regulatory compliance, and emergency response. Through this course, students will develop the skills necessary to foster a culture of safety, minimize chemical-related risks, and uphold ethical and environmental responsibilities in professional chemical practices.

Detailed Contents

2. Introduction to chemical safety & risk management. Importance of chemical safety and risk management principles. Types of hazards (physical, health, environmental). Chemical hazards & risk assessment. Understanding SDS components, Safety Data Sheets (SDS) & globally harmonized system (GHS) of classification and labeling. Safe handling & storage of chemicals. Personal protective equipment (PPE) selection and usage. Waste management. Regulatory Frameworks (OSHA, EPA, REACH regulations), Industry-specific safety standards & Compliance. Spill control and containment procedures. Fire safety and extinguisher types (PASS technique), first aid for chemical exposures (inhalation, skin contact, ingestion). Risk Assessment & Control Measures, Emergency Response & Incident Management. Industrial accidents and lessons learned. Ethical responsibility in chemical safety.

Course Outcomes

By the end of this course, the students will be able to:

3. Identify hazards and assess risks associated with chemical handling, storage, and disposal in laboratories and industries.

4. Implement safety protocols and hazard management strategies to minimize chemical and health risks.

5. Assess the importance of chemical safety in maintaining environmental sustainability and regulatory compliance in industry.

Relevant Experiments

6. Nil

Recommended Books

1. Leeuwen, C. J. & Vermeire, T.G. (Eds.). (2007). Risk Assessment of Chemicals: An Introduction (2nd ed.). Springer Dordrecht. ISBN: 978-1-4020-6101-1.

2. Shah, M. R. (2023). Safety in the Chemical Laboratory and Industry-A Practical Guide (2nd ed.). Elsevier. ISBN: 978-0-323-95181-4.

3. National Research Council (2011). Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards (2nd revised ed.). National Academies Press. ISBN: 978-0309138642.

4. Finster, D. C. & Hill, R. (2016). Laboratory Safety for Chemistry Students (3rd ed.). Wiley. ISBN 978-1119027669

5. National Academies of Sciences, Engineering, and Medicine (2016). Chemical Laboratory Safety and Security: A Guide to Developing Standard Operating Procedures. National Academies Press. ISBN: 978-0-309-39220-4.

6. Current Literature and Reviews.