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| 1.  | Title of the course   | Process Safety and Industrial Pollution |
| 2.  | Course number   | CH4103                                  |
| 3.  | Status of the course  | Core                                    |
| 4.  | Structure of credits  | 3-0-0-3                                 |
| 5.  | Offered to  | UG                                      |
| 6.  | New course/modification to  | New course                              |
| 7.  | To be offered by  | Department of Chemical Engineering      |
| 8.  | To take effect from   | July 2020                               |
| 9.  | Prerequisite  | Nil                                     |
| 10. | Whether approved by the Department  | Yes                                     |
| 11. | <b>Course Objective(s):</b> To introduce aspects of process and personnel safety, and pollution in the chemical industry.   |   |
| 12. | <b>Course Content:</b> Process safety: process versus personnel safety; Effect of toxicants, dose versus response, threshold limits; Government regulations and evaluation of industrial hygiene; Leakage of liquid and gas; Parameters affecting toxic release and dispersion; Fires and explosions, ignition-flammability diagrams, detonations and blasts, prevention; Identification of reactive chemical hazards, characterization techniques, control; Sizing and design of relief and venting systems; Hazard and operability (HAZOP) studies; Industrial pollution: origin of air, water and land pollutants; Environmental impact assessment; Quality monitoring of major pollutants; Industrial pollution in India; Management of hazardous wastes and pollution control; Introduction to green technologies. |   |
| 13. | <b>Textbook(s):</b><br>1. Crowl D A and Louvar J F, <i>Chemical Process Safety: Fundamentals with Applications</i> , 4th Edition, Pearson India (2019).<br>2. Rao C S, <i>Environmental Pollution Control Engineering</i> , 3rd Edition, New Age International (2018).  |   |
| 14. | <b>Reference(s):</b><br>1. Kletz T, <i>What went wrong: Case Histories of Process Plant Disasters and How They Could Have Been Avoided</i> , 6th Edition, Butterworth-Heinemann (2019).<br>2. Kletz T and Amyotte P, <i>Process Plants: A Handbook for Inherently Safer Design</i> , 2nd Edition, CRC Press (2010).<br>3. Lees F, <i>Loss Prevention in the Process Industries: Hazard Identification, Assessment and Control</i> , 4th Edition, Butterworth-Heinemann (2012).<br>4. Peirce J J, Vesilind P A and Weiner R, <i>Environmental Pollution and Control</i> , 4th Edition, Butterworth-Heinemann (1997).   |   |