5MEMS7 SAFETY MANAGEMENT SYSTEMS AND RISK ASSESSMENT - [5 credits]

Lecturers:  
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Semester: 1

Prerequisite Module: (Recommended) Advanced Manufacturing, Supply Chain Management

Module Organisation

The module runs for 12 weeks of the academic year and comprises three lectures and one tutorial per week (except the study week). Total contact time is 44 hours.

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<th>Start Week</th>
<th>End Week</th>
<th>Lectures per week</th>
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<th>Tutorials per Week</th>
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Module Description

Aim of the module is to provide the fundamental criteria and the methodological approaches for the design and management of system safety approaches for industrial operations, for production and service, in the view of minimization of operational risks.

Learning Outcomes

On successful completion of this module, students will be able to:

1. Develop a conceptualization of System Safety Engineering considering an historical perspective
2. Know the main references in relation to legislative framework requiring Risk Assessment and Safety Management System in industry
3. Be able to use the main engineering methods for Risk Assessment (HAZID, HAZOP, FAULT TREES, EVENT TREES, BOW TIES etc.)
5. Understand the need for Accident reporting, analysis and investigations, and the monitoring of safety performance
6. Understand the role of human performance in connection with system performance and the impact of human and organisational error and the conditions for it
7. Be able to apply basic human reliability analysis methods to key industrial tasks.
Module Content

- Operational Risk Management from an historical and legislative perspective (Fundamentals and Principles of Industrial Safety and Health Occupational, Compliance and laws on prevention of occupational risks)
- System Safety Engineering in Industrial applications examples (types of risks workers are exposed to)
- Hazard identification, according to the activity and the workplace
- Engineering methods for risk assessments (HAZID, HAZOP, FT, ET, BOWTIE)
- Human and Organisational risk factors analysis
- Human Reliability Assessment
- Occupational Safety Management (methods for reducing the incidence of accidents, occupational hazards and diseases of the worker, in and out of their work environment)
- Hierarchy of controls. Fundamentals of industrial hygiene (Selection, use and maintenance of Personal Protective Equipment)
- Monitoring safety Performance (Accident reporting and analysis)
- Seminar: safety management in two industrial examples (inviting the safety managers of two very different realities)
- Project Risk Management
- Group work on a concrete scenario, paper preparation and review

Module Notes

Web pages-blackboard-webCT
Selected research papers
Handouts from guest lecturers

Teaching Strategies

This module is typically a small group environment with approx 20 or less people participating. Hence the class forms the basis for discussion on topics, as well as more formal podium style lectures. Examples related in the class are often research led through discussion on leading research projects. Visiting lectures range from industry to visiting researchers.

Assessment Modes

Written Exam (70%), Group Assignment (30%)

Recommended Texts


- Trevor Kletz Lessons from Disaster - How Organisations Have No Memory and Accidents Recur(1993) IChemE

Other Relevant Texts


Laboratory

Group work on a concrete industrial case study