Module Code: MESMM7
Module Name: SAFETY MANAGEMENT SYSTEMS AND RISK ASSESSMENT
ECTS Weighting: 5 ECTS
Semester taught: Semester 1
Module Coordinator/s: Dr. Chiara Leva (Levac@tcd.ie), Professor Garret O’Donnell (Garret.Odonnell@tcd.ie)

Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline:

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

The 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.

- 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

1 TEP Glossary
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 or equivalent domain specialists)

Project Risk Management

Group work on a real world scenario, report preparation and review

Graduate Attributes: levels of attainment

To act responsibly - Attained
To think independently - Enhanced
To develop continuously - Enhanced
To communicate effectively - Attained

Teaching and Learning Methods

This module is typically a modest group size environment and sub divided as necessary for group project activity. 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/guest lectures include industry domain specialists e.g safety managers as well as visiting researchers specialising in risk in industrial systems.
### Assessment Details

Please include the following:

- Assessment Component
- Assessment Description
- Learning Outcome(s) addressed
- % of total
- Assessment due date

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<tr>
<th>Assessment Component</th>
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<td>Written Exam</td>
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### Reassessment Requirements

#### Contact Hours and Indicative Student Workload

**Contact hours: 33 Hours**

- Independent Study (preparation for course and review of materials): 33
- Independent Study (preparation for assessment, incl. completion of assessment): 33

### Recommended Reading List

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

### Module Pre-requisite

Recommended: Advanced Manufacturing modules, Supply Chain Management or equivalent from visiting institutions

### Module Co-requisite

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2 TEP Guidelines on Workload and Assessment
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<tr>
<th><strong>Module Website</strong></th>
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<tr>
<td><strong>Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.</strong></td>
<td>No</td>
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<td><strong>Module Approval Date</strong></td>
<td>08-08-2019</td>
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<tr>
<td><strong>Approved by</strong></td>
<td>G. O’Donnell</td>
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<tr>
<td><strong>Academic Start Year</strong></td>
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