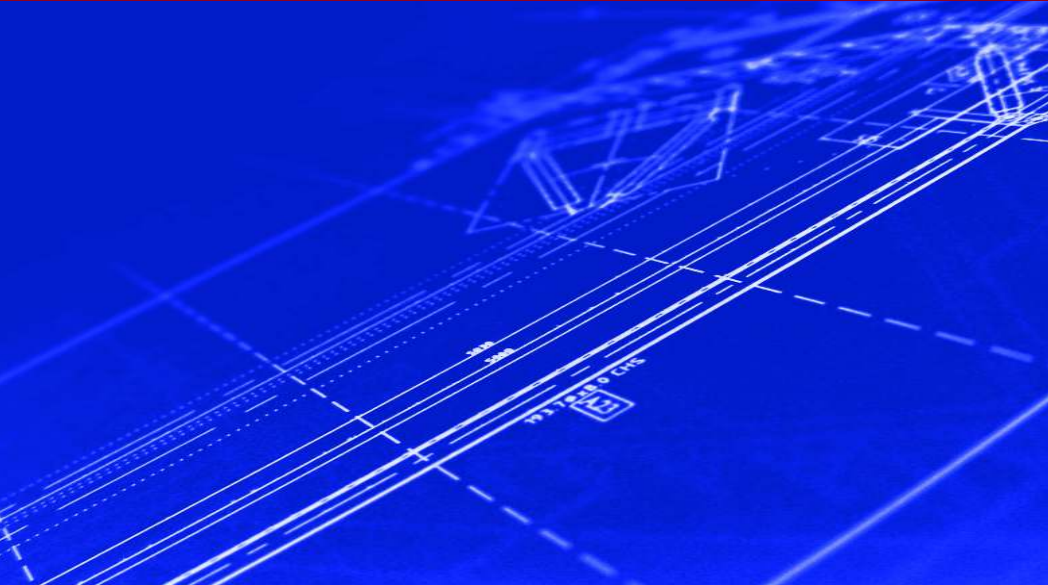


Hazards in Process Plant Design and Operation



Course Content

- **Mechanical failure** — principal mechanical failure modes including: deflection, plastic collapse, fracture, fatigue, creep and wear
- **Tutorial calculations in fracture mechanics** — Failure Assessment Diagrams (FAD)
- **Corrosion** — how to design systems to avoid corrosion and examples of best practice
- **Maintenance management to avoid failures** — plant diagnostic condition monitoring including benefits and relative costs
- **Data gathering systems and fault diagnosis**
- **Classification of hazardous areas**
- **Chemical Agents Directive (CAD)**
- **Explosive atmospheres directive (ATEX 137)**
- **Dangerous Substances and Explosive Atmospheres (DSEAR)**
- **Control of Substances Hazardous to Health (COSHH)**
- **Inherent safety** — an approach to process design and operation which builds safety, health and environmental considerations in at the start

Unit Code: CPE 6200

Major investments in the chemical, process and off-shore industries require understanding of all likely hazards. This module concentrates on ways to minimise the risk of mechanical failure affecting any equipment you design, run or maintain.

It considers mechanical stress, stress concentration and the measurement and analysis of service loads. A study is made of mechanical properties and the principle modes of failure: deflexion, plastic collapse, creep fatigue and fracture.

Design against failure requires a knowledge of linear elastic fracture mechanisms. Corrosion is studied following the principles of minimisation and prevention.

Electrical hazardous area classification for gases and dusts are examined. The analysis of hazards associated with process design and operation are reviewed. The principles of inherent safety are introduced.

