



LTH

FACULTY OF
ENGINEERING

Course syllabus

Processriskanalys Loss Prevention

KETF35, 7,5 credits, G2 (First Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED B/K

Date of Decision: 2023-04-18

General Information

Main field: Technology.

Elective Compulsory for: K3

Elective for: B4, RH4, W4-p, R4

Language of instruction: The course will be given in Swedish

Aim

The course is intended to give an overall overview of methods and theories for the identification, analysis and minimisation of risks, as well as mechanisms and calculus methods for hazardous events within the chemical industry.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- Comprehend the complete procedure of risk assessment within the process industry.
- Be able to account for the concepts risk chemicals and risk processes.
- Understand when and why a risk assessment is required.
- Account for all the steps included in a technical risk assessment.
- Understand how a hazardous event is propagated in a process plant.
- Be able to evaluate and compare risks in light of criteria of acceptable risks
- Understand how safety systems may be applied to minimize risks.

Competences and skills

For a passing grade the student must

- Select required tools for a required risk assessment.

- Be able to carry out risk qualitative as well as quantitative risk assessments.
- Be able to perform analyses of consequences of an accident.

Judgement and approach

For a passing grade the student must

- Perform in-depth practice and calculation of HazOp, fault-tree analysis, dispersion modeling and runaway reactions.
- Complete a project work of a risk assessment on an industrial plant, including a written documentation and an oral presentation.

Contents

Risk management. Hazardous chemicals and processes. Reliability: Component failure. Failure mechanisms of equipment during its life cycle. Logical diagrams. Risk assessment: Check lists, index methods, HazOp and fault tree analysis. Consequence analysis: Process failure. Uncontrolled release and dispersion of gases and liquids. Fire and explosion. Runaway reactions. Risk evaluation: Risk acceptance criteria. Safety barriers and safe guards. Process operation and maintenance. System solutions.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: Written examination, calculation and project assignments. The grade is based on the written examination and addition of up to 0.5 from the calculation and project assignments.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts

Code: 0117. **Name:** Theory.

Credits: 4,5. **Grading scale:** UG. **Assessment:** Written examination.

Code: 0217. **Name:** Calculation.

Credits: 3. **Grading scale:** UG. **Assessment:** Calculation and project assignments.

Admission

Admission requirements:

- KETF01 Transport Phenomena, Basic Course or KETF40 Mass Transfer Processes in Environmental Engineering or VBRN45 Risk Assessment in Fire Protection Engineering or VRSN05 Foundations for Risk Assessment and Management

Assumed prior knowledge: KETF25 Reaction Engineering and KETF10 Separation Processes, Basic Course

The number of participants is limited to: No

The course overlaps following course/s: KTE131

Reading list

- Karlsson, H T: Processriskanalys. LTH, 2012.
- Karlsson, H T: Omniboken i processriskanalys. LTH, 2012.

Contact and other information

Course coordinator: Christian Hulteberg, christian.hulteberg@chemeng.lth.se

Course homepage: <https://www.ple.lth.se/en/>