

Course Syllabus

Failure Analysis and Prevention 7.5 Credits*, Second Cycle Level 1

Learning Outcomes

After completion of the course the students shall be able to:

- Explain the significance of failure analysis in engineering design.
- Design and implement an appropriate strategy to handle the specific failure component
- Implement detailed root-cause analysis
- Apply various tools and techniques to identify the failure mechanism
- Describe the various material factors that cause the failure
- Propose appropriate corrective and preventive guidelines

Course Content

Failure analysis is a procedure to determine failure mechanisms and root causes by way of detailed investigation. It is important to establish recommendations to prevent or reduce the frequency and the consequences of failures. This course is a combination of lectures and project work based on case studies so that students gain practical experience in the analysis of fractured and failed engineering materials and components. The course will provide a practical understanding of various causes of failure based upon theoretical knowledge of concepts that are involved in engineering material failures. This course introduces the concepts of failure analysis, root-cause analysis, and the role of failure analysis as a general engineering tool for enhancing product quality and failure prevention. The major causes of the common mechanical failure of the engineering components or structure due to fracture, fatigue, creep, wear and corrosion are discussed. A pragmatic approach towards the ways of description and interpretation of fracture surfaces features, resulting from various types of failures, will be addressed with the help of industrial failure case studies.

Assessment

Written examination (5 credits)

Assignment (1 credit)

Project work (1,5 credits)

Forms of Study

Lectures, assignments on published case studies and project works on real-time failed components from various sources. The assignments and project work are mandatory.

Grades

The Swedish grades U, 3, 4, 5.

In the examination, the grading scale U, 3, 4, 5 is used.

On the project work and assignment, the grades U, G are used.

To receive an overall passing grade for the entire course, students must pass all subjects.

The written examination determines the student's final grade in the course.

Prerequisites

Mechanical Properties of Metals 7.5 credits First Cycle

Materials and Surface Characterisation 7.5 credits Second level

Bachelor of Engineering (Mechanical, Metallurgy, Materials Science, Production Engineering) of at least 180 credits and English 6

Other Information

Replaces MP3031.

Subject:

Materials Technology

Group of Subjects:

Materials Technology

Disciplinary Domain:

Technology, 100%

This course can be included in the following main field(s) of study:

1. Materials Technology

Progression Indicator within (each) main field of study:

1. A1N

Approved:

Approved 28 January 2020

Valid from 28 January 2020