Linnæus University

Dnr: LNU-2024/434

Course syllabus

Faculty of Technology
Department of Mechanical Engineering

4MT088 Smart underhållsteknik för ledare , 3,5 högskolepoäng
Smart maintenance technology for leaders , 3.5 credits

Main field of study
Mechanical Engineering

Subject
Mechanical Engineering

Level
Second cycle

Progression
A1N

Date of Ratification
Approved 2024-02-07.
The course syllabus is valid from spring semester 2024.

Prerequisites
Basic qualification at advanced level in mechanical engineering or equivalent. Applicants who do not meet this requirement can, by showing corresponding prior knowledge through work experience, be validated as qualified. Two years of relevant work experience is considered equivalent to one year of university studies at bachelor's level.

Objectives
After completing the course, the students should be able to:

- describe relevant technology solutions that can be used to achieve smart maintenance
- explain how technology solutions support different maintenance strategies, with a specific focus on predictive maintenance

- identify information needs for maintenance-related activities for the execution of maintenance as well as the management of maintenance
- create an industry 4.0/digitalization strategy for the maintenance operations

Content

The course consists of three parts. In the first part, we focus on technology solutions and how these are used to achieve smart maintenance. You will gain a practical understanding of how the technology works and what possibilities and limitations they have. We also describe the basics of predictive maintenance. The second part focuses on information needs for smart maintenance and how this can be ensured with technology solutions. You do exercises to define what data and information is needed to plan, prepare, implement, and follow up smart maintenance and then identify how you get access to this data. The third part addresses how a digitization strategy can be established for the maintenance organization.
The course includes the following elements:

- the concept of smart maintenance
- technology solutions for the realization of smart maintenance and their possibilities and limitations
- maintenance concepts, maintenance strategies and maintenance systems and how these can be realized with the help of technology solutions
- maintenance information needs
- methods for definition and identification of information needs

- digital transformation and digitization strategies

Type of Instruction

The teaching consists of lectures, tutorials, and seminars.

Examination

The course is assessed with the grades Fail (U) or Pass (G).

Assessment of students´ performance is made through 3 written assignments as well as oral presentations and discussions in 3 seminars.
The examination of the course is divided into the following parts

- Assignments 2,5 credits
- Seminars 1 credit

All parts must be approved to be approved in the course. The final grade of the course is obtained when all the moments are approved.

Resit examination is offered in accordance with Linnaeus University’s Local regulations for courses and examination at the first- and second-cycle levels. In the event that a student with a disability is entitled to special study support, the examiner will decide on adapted or alternative examination arrangements.

Course Evaluation

A course evaluation should be conducted during the course or in connection with its conclusion. The results and analysis of the completed course evaluation should be

promptly communicated to students who have completed the course. Students participating in the next course instance should be informed of the results of the previous course evaluation and any improvements that have been made, no later than at the start of the course.

Required Reading and Additional Study Material

Hagberg, Leo & Henriksson, Tomas (2018). Underhåll i världsklass. OEE Consultants AB, Lund. ISBN 9789163966163. 200 out of 640 p.

Kans, Mirka (2023). Are we there yet? – Looking at the progress of digitalization in maintenance based on interview studies within the Swedish maintenance ecosystem. IAI2023 - 7th International Congress and Workshop on Industrial AI and eMaintenance, 13 - 15 June 2023, Luleå, Sweden. 6 p.

Achouch, Mounia, Dimitrova, Mariya, Ziane, Khaled, Sattarpanah Karganroudi, Sasan, Dhouib, Rizck, Ibrahim, Hussein & Adda, Mehdi (2022). On Predictive Maintenance in Industry 4.0: Overview, Models, and Challenges. Applied Sciences (2076-3417), 12(16), N.PAG. https://doi.org/10.3390/app12168081. 22 p.

Material distributed via the course website.