



Faculty of Technology and Science  
Mechanical and Materials Engineering

## Syllabus

### Course Approval

The syllabus was approved by the Faculty Board of Technology and Science on 23 February 2012, and is valid from the Autumn semester of 2012 at Karlstad University.

**Course Code:** MTAD19

**Surface Technology and Tribology, 7.5 ECTS Credits**  
(Ytteknik och tribologi, 7.5 Swedish credit points)

**Degree Level:** Master

**Progressive Specialisation:** A1N (Second cycle, has only first-cycle course/s as entry requirements)

### Language of Instruction

The language of instruction is Swedish or English. Contact the course coordinator for further information.

### Prerequisites

Mechanical Engineering, 75 ECTS Credits, including 15 ECTS Credits in courses in materials engineering or the equivalent.

### Major Field of Study

MTA (Mechanical Engineering)

### Learning Outcomes

The aim of the course is that students shall obtain the basic knowledge of surface technology and tribology needed to analyze tribological problems in industrial applications and be able to propose solutions based on design changes, improved selection of materials, or use of tribological surfaces.

Upon completion of the course, students should be able to:

- explain and apply central concepts of the field of tribology, including friction, wear, and lubrication
- give an account of the mechanisms controlling friction and wear in a tribological contact
- give an account of the basic tribological properties of the material classes metals, ceramics, and polymers
- give an account of procedures and use basic tribological knowledge to analyze tribological problems
- compare surface treatment methods to each other with reference to their applicability in a given tribosystem.

### Content and Form of Instruction

Elements of the course:

- lectures and seminars covering the mechanical contact and friction of surfaces, lubrication and lubricants, wear, and different contact cases and mechanisms; the tribological properties of metals, ceramics, and polymers; surface treatment, surface modification, and surface finishing; tribological problems and measures; abrasion testing.

### Reading List

See separate document.

## Examination

Examination is in the form of a written exam, oral and written presentations of seminary assignments.

## Grades

One of the grades 5 (Distinction), 4 (Some Distinction), 3 Pass , or Fail (U), is awarded in the examination of the course.

## Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course assessment is based on student views and experiences as reported in written course evaluations and/or group discussions. Students will be informed of the result of the evaluation and of the measures to be taken.

## Course Certificate

A course certificate will be provided upon request.

## Additional Information

Students who enrolled before 1 July 2007 will complete their studies in accordance with the requirements of the earlier admission. Upon completion students may request degree and course certificates to be issued under the current ordinance if they meet its requirements.

The local regulations for studies at the Bachelor's and Master's levels at Karlstad University stipulate the obligations and rights of students and staff.

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