

## **Tools and material handling**

The subject of tools and material handling covers planning, calculating and assembling in many different areas. Furthermore, the subject deals with how to handle tools, materials, machines and fasteners, and the contexts in which they can be used.

### **Aim of the subject**

Teaching in the subject of tools and material handling should aim at helping students develop knowledge of how equipment, materials and fasteners are chosen, used and maintained in safe and correct ways in the working environment. It should also help students develop the ability to plan, carry out evaluate and document work in accordance with environmental and working life requirements. In addition, students should be given the opportunity of developing knowledge of fire risks and preventative fire protection in their working environment.

Teaching should lead to students developing these skills in using tool manuals and drawings with material standards. It should also help students develop their knowledge of technological development concerning tools, materials and fasteners.

By exercises in practical assembly tasks, students should be given the opportunity to develop the ability to choose, use and maintain tools, materials and fasteners in safe, ergonomically correct and environmentally conscious ways. Students should also be given opportunities to develop the ability to communicate and cooperate in their work.

### **Teaching in the subject of tools and material handling should give students the opportunities to develop the following:**

- 1) The ability to choose and use tools, machines, materials and fasteners.
- 2) Knowledge of necessary safety aspects.
- 3) Skills in carrying out assembly tasks in accordance with laws and other regulations, guidelines and standards.
- 4) The ability to interpret drawings and material standards.
- 5) The ability to use and follow manuals for tools.
- 6) Knowledge of ergonomics and the working environment for current tasks.
- 7) The ability to maintain tools and machines.
- 8) Skills in carrying out quality controls of completed tasks.

### **Courses in the subject**

- Tools and material handling, 100 credits.

## Tools and material handling

The course, tools and material handling, covers points 1–8 under the heading Aim of the subject.

### Core content

*Teaching in the course should cover the following core content:*

- Factors affecting choice of tools, machines, materials and fasteners.
- Use and care of tools and machines for work tasks from sustainability, safety and environmental aspects.
- Safety aspects and limitations of what can be done based on different eligibility requirements.
- Assembling in accordance with laws and other regulations, guidelines and standards for different materials and fasteners.
- Interpretation and application of assembly drawings and material standards for tasks.
- Manuals and guidelines from tool manufacturers.
- Ergonomics and the working environment for relevant tasks and how tools can facilitate the work.
- Quality control in terms of load tests, self-monitoring and documentation of work.

### Knowledge requirements

#### Grade E

Students choose and use **in consultation** with the supervisor tools, machines, materials and fasteners adequately for different tasks. In their work, students take into account necessary safety aspects.

Students carry out **in consultation** with the supervisor **simple** assembly work in accordance with laws and other regulations, guidelines and standards with **satisfactory** results. In their work, students interpret **with some certainty** drawings and material standards. Furthermore, students use and follow **with some certainty** manuals for tools and also carry out work ergonomically and in ways safe for students themselves and others.

After the work has been completed, students maintain **in consultation** with the supervisor tools and machines. In addition, students carry out **after consultation** with the supervisor quality controls on the tasks performed.

In consultation with the supervisor, students assess **with some certainty** their own ability and the requirements of the situation.

## Grade D

Grade D means that the knowledge requirements for grade E and most of C are satisfied.

## Grade C

Students choose and use **after consultation** with the supervisor tools, machines, materials and fasteners adequately for different tasks. In their work, students take into account necessary safety aspects.

Students carry out **after consultation** with the supervisor assembly work in accordance with laws and other regulations, guidelines and standards with **satisfactory** results. In their work, students interpret **with some certainty** drawings and material standards. Furthermore, students use and follow **with some certainty** manuals for tools and also carry out work ergonomically and in ways safe for students themselves and others.

When the work has been completed, students take care of **after consultation** with the supervisor tools and machines. In addition, students carry out **after consultation** with the supervisor quality controls on the tasks they have performed.

In consultation with the supervisor, students assess **with some certainty** their own ability and the requirements of the situation.

## Grade B

Grade B means that the knowledge requirements for grade C and most of A are satisfied.

## Grade A

Students choose and use **after consultation** with the supervisor tools, machines, materials and fasteners adequately for different tasks. In their work, students take into account necessary safety aspects.

Students carry out **after consultation** with the supervisor **complex** assembly work in accordance with laws and other regulations, guidelines and standards with **good** results. In their work, students interpret **with certainty** drawings and material standards. Furthermore, students use follow **with certainty** manuals for tools, and also carry out work ergonomically in ways which are safe for themselves and others.

When the work has been completed, students take care of **after consultation** with the supervisor tools and machines. In addition, students carry out **after consultation** with the supervisor quality controls on the tasks they have performed.

In consultation with the supervisor, students assess **with certainty** their own ability and the requirements of the situation.