



Type of tender:

- **Announcement of a practical study phase (15 ECTS) at the WWHK**
- **Invitation to tender for a practical phase + Bachelor's thesis/Master's thesis (30 ECTS)**
- **Announcement of a research & development module (10/30 ECTS) (depending on the type of student work, the scope can be adjusted accordingly)**

Development of a preparation specification for the microstructural analysis of metallic materials

The microstructure of a material can be analysed as part of a microstructure analysis. This is the carrier of the mechanical, physical and chemical properties. By analysing the grain size, phase components and other microstructural parameters, initial estimates of these properties can be made. In order to ensure the reproducibility of analysis results, a defined sample preparation is essential. This is divided into cutting out a suitable sample piece, embedding, grinding and polishing the embedded sample and subsequent etching. However, the quality of the preparation of different materials can vary greatly with the same preparation parameters. Therefore, the optimum grinding /polishing times, pressures, speeds and the best etching solutions and times for the individual materials must be known.

In a first step, optimum grinding and polishing parameters are to be determined empirically for different metallic materials that are analysed as standard at the WWHK. By systematically varying the pressure, time and rotational speed of the grinding and polishing machine available at the WWHK, different results can be produced. The surface qualities of the prepared samples will then be analysed and evaluated qualitatively and quantitatively using confocal and digital microscopy.

In a further step, following the definition of the grinding and polishing specification for the different materials, a customised etching specification will be developed. Depending on the material, the etching solution and duration can be varied and then analysed again microscopically.

The documentation of the procedures and the results as well as their evaluation is carried out in the form of a report.

Duration: according to the PO and type of student work Start: immediately