1.7 Short guide through the lecture

1. In the first part we discuss some aspects of non ideal mixtures including phase diagrams which summarize in a compact way mixing effects.

2. When mixing components chemical reactions may occur changing the concentration of the compounds. Equilibrium reactions depending on pressure, temperature, and electrical potential (i.e. electrochemical reactions) will be discussed. The last item shows many similarities e.g. the diode equation for a pn-junction.

3. Afterwards several aspects of the most relevant transport mechanisms (drift, diffusion, heat transport) will be discussed which describe the path to thermodynamic equilibrium.

4. The last part of the lecture deals with the statistical approach for describing thermodynamics making it nearly to a branch of very "precise" mathematics. It allows deeper insight, e.g. into the meaning of thermodynamic potentials, and is a completely different and very elegant approach to thermodynamics. Since it is a very abstract description it needs to be introduced by classical thermodynamics and thus is the last part of the lecture.