

The universities within today's knowledge society face enormous pressure to impart more knowledge and operational competence in less time to a target group that grows larger and more inhomogeneous. Therefore the core processes of knowledge organisation have to become more effective and efficient. In order to prepare students for the job market, also the methods of teaching and learning must encourage the core competencies that are necessary for today's knowledge workers. Addressing the issue of how university IT-infrastructures can support the resulting new requirements, this thesis presents an alternative to the classic monolithic learning platforms: A component-oriented system architecture with a server core that not only facilitates central functions but which can also be complemented with new services for traditional e-learning and also for self-organised and cooperative scenarios. This thesis thereby focuses on the interdependent specification and development of this central platform and the belonging applications. For that purpose three objectives are identified:

- (1) Defining a controlled language that — within the whole university -- improves specification of learning and working scenarios.
- (2) Conceptual design of a component-orientated architectural framework, which functions as a standard platform for a variety of shared e-learning applications and is also integrated into the existing university IT-infrastructure.
- (3) Developing a methodical approach for implementing the standard platform and the belonging applications in accordance with the chosen controlled language approach and the architectural framework.

The last part of this thesis describes the successful implementation of this approach in the cooperative learning and working platform koALA at the university of Paderborn.