Recommendations for Bachelor-/ Master Programs in Computer Science

Hans-Ulrich Heiss

Member of the Board of Fakultätentag Informatik
Dean of Studies, Dept. IV EE & CS
Technische Universität Berlin
Einsteinufer 17 / EN 6
D-10587 Berlin
heiss@computer.org

Abstract:

Since the first introduction of Informatics/CS programs at German universities in the late sixties, the education in informatics took 9 semesters and ended with the diploma. Now, almost 40 years later, the advent of the Bologna process forces German universities to perform the transition to two-stage Bachelor/Master programs. Although many Informatics departments did not welcome the abolishment of the well established diploma degree, the transition was regarded as an opportunity to overhaul the study programs towards updated contents, new structures and improved qualifications for the students.

Previously, compatibility of curricula and equivalence of degrees between the German universities was enforced by a regulation framework which all university programs in Informatics had to comply with. This was important since in the German federal system, the individual states are responsible for education. Today, this framework has been replaced by an accreditation system that considers study programs not only of universities, but of all institutions of higher education. Therefore, the member universities of the German Informatics Faculty Conference (Fakultätentag Informatik, FTI) decided to develop their own recommendations to ensure a high quality and scientific orientation of their programs and to maintain the compatibility between different states and their universities. The design goal was to set standards, e.g. by defining a list of mandatory subjects but at the same time to leave room for specific profiles for the particular universities. A company hiring a graduate from any member university should know what kind of competence they get.

The recommendations, established in November 2004, are organized in three parts. The first part states general aspects of study programs, i.e. degrees, duration, employability, exams, marks, counselling and quality assurance. It also recommends the general structure and contents of a bachelor (6 semester, 180 cp) and a master (4 semester, 120 cp) program. The second part is devoted to the outcome qualifications and clearly states which competences the graduates should have. This is further refined separately for the bachelor and the master degree. These competences are broken down into different areas or domains (e.g. algorithms, software development, IT security,..) indicating which knowledge, skills or problem awareness are required. The third part goes even deeper into detail by defining minimum requirements (in terms of ECTS credit points) for different areas in the bachelor program: foundation of informatics (min. 35 cp), systems informatics (min. 50 cp), mathematics (min. 25 cp), and, in addition, listing mandatory and elective subjects for each area. For the master programs, the recommendations are less specific, since its contents strongly depend on the individual research areas of the particular departments or universities.

Despite all endeavours of German politics towards establishing some elite universities and as a result, more differentiation concerning academic excellence and ranking, it is seen as a quality of the German university system that the average graduate has a reliable high scientific competence regardless from which university he or she graduated. These recommendations are geared to keep this up.

The presentation gives an overview of the recommendations and the rationale behind. It can be tailored to 15 or 25 minutes duration.