Teaching Standards in Biomedical Engineering Sciences

About the Department of Biomedical Engineering at the University of Applied Sciences Technikum Wien

The research topics within the Department of Biomedical Engineering cover three areas of expertise: biomedical engineering, biomedical computer science, and rehabilitation technology. The department coordinates six bachelor's and four master's programmes taught by full-time personnel and freelance lecturers from research and industry. The MBE program (http://www.technikum-wien.at/en/study_programs/master_s/biomedical_engineering_sciences/) offers an interdisciplinary education that integrates medical requirements and technical solutions. Within the two areas of biomedical informatics and biomedical engineering, students can choose courses from elective modules to sharpen their individual profiles. Within the two-semester course of “Project Related Teamwork,” students focus on a scientific project, manage it themselves, and work out the intended solution while supervised by a senior lecturer. These projects often involve the use of medical IT standards and involve heterogeneous groups of stakeholders. The students have to identify, understand, and deal with the many different points of view that they are confronted with throughout this scientific project. Different points of view are raised both from within the groups of students as well as from the stakeholders and users in “the world out there.”

FH-Prof. DI Dr. Stefan Sauermann

As head of the committee for “Medical Informatics” (ON-K238) of the Austrian Standards Institute, FH-Prof. Dr. Stefan Sauermann is familiar with the use and value of technical standards in Healthcare IT. Since 2005 he has served as moderator of the Working Group 2 “Interoperability-Standards” of the Austrian e-Health initiative. He is also a contributor to the Austrian Electronic Healthcare Record project (ELGA). A member of the faculty at the University of Applied Sciences Technikum Wien (UAS TW) since 2007, he has held the position of program director of the Biomedical Engineering Sciences master's study program (MBE) and is also an eHealth lecturer and key researcher.

For more Practical Ideas for Professors, visit www.ieee.org/education_careers/education/standards/educators_resource_library.html
Using Standards in Biomedical Engineering Sciences

Within the bachelor’s and master’s programmes related to Biomedical Engineering, different methods exist for integrating standards into the academic curricula. The end result is the same in any of the scenarios: that students learn how to handle standards.

Education about standards begins in the bachelor’s programme for Biomedical Engineering (http://www.technikum-wien.at/en/study_programs/bachelor_s/biomedical_engineering/) (BBE). The courses include theoretical lessons and practical assignments about the software development lifecycle and software testing, and students take exams covering the course content. In addition, they carry out and document a software project. During the development phase of their software, students are introduced to the basics of software testing according to the IEEE 829 standard.

In the MBE program, detailed knowledge about IHE Technical Frameworks and their basic technologies, like HL7 v2x and HL7 v3 (CDA), is both introduced in lectures as well as practiced in small assignments, thus challenging students to apply their understanding in small, practice-oriented tasks. Furthermore, the ISO/IEC 11073 PHD series of standards is part of the curriculum. Students face the task of transmitting medical data from a personal health device via a mobile device to a personal health record (PHR) or an electronic health record (EHR). The EHR is evolving into an important element of current knowledge for biomedical engineers as regional and national EHRs gradually are implemented around the planet. The team leading the eHealth research focus at UAS TW is active within IHE and the Continua Health Alliance and in many activities around IT standards for healthcare. This continuing exchange assures that the knowledge remains current over time. In the master’s programme for Healthcare and Rehabilitation Technology (http://www.technikum-wien.at/en/study_programs/master_s/healthcare_and_rehabilitation_technology/), the standards are taught by combining theory and practice in a one-year project. In the first part of the course, the students develop software for the medical environment in collaborative small groups. In the second part, they learn the theory corresponding to the ISO/IEC 13485 and ISO/IEC 62304 standards and apply this knowledge to their working procedure of the first part.

The team of researchers and lecturers of the eHealth team offer not only personal experiences but also the most up-to-date information, which enables students to deal with new challenges and to develop their own solutions.

Knowledge about standards and how they are applied combined with cutting-edge research involvements and results leads to valuable cooperation with industry. As a result, students are already involved in industry projects during their courses and often profit from a shorter transition time between graduation and working life.

www.technikum-wien.at
FH-Prof DI Dr. Stefan Sauermann: stefan.sauermann@technikum-wien.at