Teaching Standards in Networking and Data Communications

Kingston University London

About the School of Computing and Information Systems (CIS) at Kingston University

The CIS School at Kingston University offers undergraduate, graduate, and doctoral programs in the areas of Computing, Information Systems, Networking and Data Communications, Network and Information Security, Embedded Systems, and Digital Media.

MSc Course in Networking and Data Communications

Our MSc in Networking and Data Communications provides students with a deep understanding of the technical characteristics of networking and data communication systems, and with the tools for systems design and deployment. The course covers specialized topics ranging from traditional information theory and digital communications and networking principles to modern paradigms in the areas of wireless communications, multimedia communications, and network and information security.

Research undertaken within the CIS School—and in particular in the Wireless Multimedia and Networking (WMN) Research Group—informs the course content, whilst the school's Industrial Advisory Panel helps ensure that this content meets business needs. Industrial and international links are key, with students benefiting from guest lectures from industrial partners, as well as international academics.

Students are expected to study four 30-credit modules in one year, including practical project-based exercises. In addition to the taught modules, the course culminates in an individual "capstone" project. Assessment for most modules is via coursework and examination on a specific topic.

Dr. Maria Martini
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Dr. Martini focuses on wireless and multimedia communications. She is actively involved in academic research in these domains and collaborations with industry. In addition to publishing scientific papers, she is the author of patents and also participates in standardization groups in the areas of wireless and multimedia communications, quality of experience definition and management, and 2D/3D image and video quality assessment (e.g., IEEE 1907.1 and IEEE P3333.1).

Practical Ideas from Professors: Standards Education in Your Courses

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Using Standards in the Networking and Data Communications

A "with business" pathway is offered in this program, allowing students to acquire additional business skills and develop innovative ways to exploit information and communications technology for business advantage. For these students, understanding the process for the development of standards—and how to use them—is particularly important.

As a Course Director for our MSc in Networking and Data Communications at Kingston University, my objective is to prepare students for their future professional practice; therefore, the latest wireless, multimedia, and networking standards are included in the regular update of our curricula.

For example, in the wireless domain, the standards presented to students include IEEE 802.11x for WiFi, IEEE 802.16x WiMax, standards for short range communications such as Bluetooth and ZigBee, as well as standards for cellular systems, ranging from GSM to 3GPP Long Term Evolution.

I also teach Multimedia Communications and, after an in-depth introduction to the principles of data compression, I introduce the main standardization bodies, their roles, and the value of standards. I cover the standards for audio, image, and video compression, including recent standards for multimedia streaming such as MPEG-DASH, and broadcasting standards such as those for Digital Audio and Video Broadcasting. I also introduce the application and requirements of medical imaging and relevant standards such as DICOM.

Thanks to my involvement in international standardization groups and in research projects whose outputs are often considered for standardization, I can rely on my experience to discuss the process for standard development.

Both undergraduate and postgraduate students have the opportunity to familiarize themselves with standards in their assignments and final project, and they are taught how to read standards documents. Module assignments and the final project can include the implementation of one or more standards and their (comparative) performance evaluation. Students are asked to identify the most suitable standard, given the requirements of the scenario and the features of the candidate standards. They may also be asked to perform measurements in real life environments.

The full versions of IEEE and other standards are available for all our students via our university's library and students are taught how to retrieve the standards documents needed for their projects. I usually recommend that students, and in particular undergraduates, start by reading the simple documents issued by standards groups to disseminate the basic principles of the standard (e.g., the "standard factsheets") rather than the full "release" of the standard.