

Catholic University of America
School of Engineering
Engineering Management Program
Strategic Standardization Curriculum
(CMGT 564 - 2010)

The purpose of *Strategic Standardization* is to create a level of awareness for graduate engineering students on significant issues associated with standards and the process of standardization. Today's world is heavily dominated by engineering, science and technology issues. The course represents a crossroads between engineering, science, technology, public policy and law. In short, the course offers graduate students a chance to examine engineering, science, and technology issues from a public policy perspective. The range of public policy issues covered in the course includes national standards strategies, health, safety, the environment, energy, sustainability, international trade, engineering ethics and potential legal risks.

Standards govern the design, operation, manufacture, and use of everything mankind produces. There are standards to protect the environment, human health, safety, and to mediate commercial transactions. Other standards ensure that different products are compatible when hooked together. There are even standards of acceptable behavior within a society. Standards generally go unnoticed. They are mostly quiet, unseen forces, such as specifications, regulations, and protocols that ensure that things work properly, interactively, and responsibly. How standards come about is a mystery to most people should they even ponder the question. With the evolution of global markets, standards are even more important to facilitate international trade. Unfortunately, they may also be used as trade barriers or to gain advantage over foreign competitors. The United States has been fortunate to have a pluralistic, industry-led standards setting process that has served us well in the past. Whether it will continue to do so in the future in the face of bruising international economic competition is uncertain (*Global Standards: Building Blocks for the Future*, Forward, U.S. Office of Technology Assessment Report to Congress (1992)).¹

Globalization is rampant and will remain so for the foreseeable future. (*The World is Flat*, Thomas Friedman (2005)).² Standards influence everything we do (UK National Standards Strategy (2003)).³ Standards control markets (German National Standards Strategy (2005)).⁴ Standardization is one of the best sources of competitive intelligence available (Canada National Standards Strategy (2005)).⁵ Standardization programs offer one of the best, most important means to evaluate current

¹ http://www.princeton.edu/~ota/ns20/pubs_f.html

² <http://www.thomaslfriedman.com/worldisflat.htm>

³ http://www.nssf.info/resources/documents/Guide_to_NSSF.pdf

⁴ http://www.din.de/sixcms_upload/media/2896/DNS_english%5B1%5D.pdf

⁵ <http://www.scc.ca/en/nss/css-scen/index.shtml>

technology, and provide a glimpse of where future technology innovations may occur. Standardization programs are indispensable for the strategic evaluation of technology and the analysis of competitive issues. In strategic terms, “If you control an industry’s standards, you control that industry lock, stock, and ledger” (Out of the Crisis, by W. Edwards Deming, Center for Advanced Engineering Study, MIT at 302 (1986)).

For over 100 years, the National Standards Policy of the United States has been the private sector will lead in the development of consensus standards and the government will play a supporting role (National Technology Transfer and Advancement Act (1995)). The United States standardization system is the most diverse standardization system in the world. According to the U.S. Department of Commerce, there are at least 600 individual standardization groups in the United States representing virtually industry in commerce. The entire rest of the world is estimated to have no more than 250 standardization groups.

The United States System is a “bottom up” system in which the private sector has the leading role. All other national standardization systems are essentially “top down” systems in which the government has the leading role. At the global level, IEEE estimates that 500,000 technology standards are the technology foundation for the global economy, and it costs at least \$1.5 billion each year to maintain the global standardization system.

Standards are created by various procedures and methods such as de facto systems (private sector), de jure systems (private sector and government), and consortia. There are a number of legal issues in standardization systems. In fact, the general environment in which standards are created resembles a complex legal maze. Legal issues include, for example, openness, fairness, public review, safety, health, the environment, competition, antitrust, intellectual property, trade and export controls, the internet, and ethics. The failure of practicing engineers to understand standards, the process of standardization, and potential legal issues related to these issues may lead to significant liability for engineers and organizations that employ them.

The future of the United States economy depends, in significant part, on effective management of its standardization system and effective participation in development of international standards. It is estimated that at least 50% of current U.S. standards practitioners will retire in the foreseeable future (3-5 years). Standards education and training of the next generation of practitioners is therefore a critical issue.

There is a clear need in the United States for greater attention to standards. In an information-based global economy, where standards are not only employed strategically as marketing tools but also serve to interconnect economic activities, inadequate support for the standards setting process will have serious detrimental effects. (U.S. Office of Technology Assessment, *Global Standards: Building Blocks for the Future*, at page 9)

In short, “[w]e have a republic if we can keep it...” (Benjamin Franklin).

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Faculty

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Curriculum

1. **A Bridge To The Future (May 19):** Course Overview; “Global Standards – Building Blocks for the Future” (Congressional Office of Technology Report, 1992), Grading (Research paper, presentation, attendance, participation & preparation).
2. **United States Standardization System – private sector (May 26):** Overview – American National Standards Institute; National Standards Strategy, private sector accredited standards development organizations, consortia, development process, organization and structure.
3. **United States Standardization System – public sector (June 2):** Overview – U.S. National Institute of Standards and Technology in the United States Standards System; Constitution, National Technology Transfer and Advancement Act, OMB Circular A-119, relationship between private sector and public sector standards.
4. **United States Standardization System (June 9):** Overview of U.S. Department of Defense Standards System; overview of U.S. Department of Energy Standards System.
5. **Standards & Trade (June 16):** Definition of international standard, International standards development organizations, organization and structure; The Strategic Value of International Standards.
6. **Standards & Trade (June 23):** Perspectives of ASTM International and the U.S. International Trade Administration,
7. **Strategic Standards Management – Corporate Views (June 30)**
8. **Testing, Certification and Conformity Assessment (July 7)**
9. **Public Policy Issues (July 14):** Due process, openness, transparency, right of appeal, global marketplace, World Trade Organization.
10. **Legal issues (July 21):** Health, safety, environment, antitrust, trade and patents.
11. **Class Presentations (July 28)**
12. **Class Presentations & Discussion (August 4)**

Grade

Research Paper (90%): A student may select any research topic related to standards or standardization approved by faculty. The research topic must be approved by June 30. The paper must be 15-20 pages in length and double spaced (not including title page, table of contents or attachments). Footnotes and citations must be appropriate for graduate research. The paper is due on August 4. Research paper examples are available at www.strategicstandards.com.

Class Presentation (10%): The class presentation must be a power point presentation lasting 10-15 minutes and based upon the research paper. Presentation examples are available at www.strategicstandards.com.