

**Catholic University of America**  
**School of Engineering**  
**Engineering Management Program**  
***Strategic Standardization Curriculum***  
**(CMGT 564 - 2008)**

The purpose of *Strategic Standardization* is to create a level of awareness, or enhance awareness, for graduate engineering students on significant issues associated with standards and the process of standardization. To a significant degree, a practicing engineering must successfully manage these issues in order to resolve complex engineering challenges. In particular, the course focuses on development of global technology standards from a United States perspective because the process of globalization directly affects the fields of engineering and technology management.

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)).<sup>1</sup>

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

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<sup>1</sup> [http://www.princeton.edu/~ota/ns20/pubs\\_f.html](http://www.princeton.edu/~ota/ns20/pubs_f.html)

<sup>2</sup> <http://www.thomasfriedman.com/worldisflat.htm>

<sup>3</sup> [http://www.nssf.info/resources/documents/Guide\\_to\\_NSSF.pdf](http://www.nssf.info/resources/documents/Guide_to_NSSF.pdf)

<sup>4</sup> [http://www.din.de/sixcms\\_upload/media/2896/DNS\\_english%5B1%5D.pdf](http://www.din.de/sixcms_upload/media/2896/DNS_english%5B1%5D.pdf)

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

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 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 is unacceptable and 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. Standards education and training of the next generation of practitioners is 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. **Global standards are a bridge to the future [May 21]**
  - Strategic Standardization Overview (Purcell)
    - Definitions: Standards & Standardization
    - Globalization
    - “Global Standards – Building Blocks for the Future” (OTA Report 1992)
  - Strategic Value of Standards Education
    - Global Survey [Invitation to comment]
    - NIST/ICES February 2008 International Workshop on Standards Education [<http://ts.nist.gov/Standards/ICES-Workshop.cfm>]
  - Grade: Research paper, presentation, attendance, participation & preparation.
2. **National Standards Strategies [May 28]**
  - National Standards Strategies Overview (Purcell)
    - United States
    - Canada
    - Germany
    - Japan
    - United Kingdom
3. **United States Standardization System (Private Sector) [June 4]**

**Guest Speaker: Jean-Paul Emard, Director, Industry Forums (ATIS)**

  - Overview (Purcell)
4. **United States Standardization System (Public Sector) [June 11]**
  - Overview (Purcell)
  - United States Constitution
  - National Technology Transfer and Advancement Act
  - OMB Circular A-119
  - Relationship between private sector and public sector standards

**5. Standards & Trade [June 18]**

**Guest Speaker: Jeff Weiss, Office of United States Trade Representatives**

- International Standards Overview (Purcell)
- Definitions (What is an international standard?)
- Organizations (What is an international standards organization?)
- “Standards & Trade – Who Cares?” (NIST Speech)
- Standards & Open Standards Systems (European Competition Commission Speech)

**6. Standards & Trade [June 25]**

**Guest Speaker: Bryan O’Byrne, International Trade Administration**

- International Standards & Trade Overview (Purcell)
- Standards and Competition
- World Trade Organization & United Nations

**7. Legal & Ethics Issues [July 2 – moved to Thursday July 3]**

**Guest Speaker: Stephen Lowell, Defense Standardization Office, U.S. Department of Defense**

- Legal and Ethics Overview (Purcell)
- Health, safety and the environment
- Antitrust & trade regulations
- Intellectual Property

**8. Strategic Value of Standardization [July 9]**

**Guest Speaker: James Thomas, President ASTM International**

- Overview (Purcell)

**9. Testing, Certification and Conformity Assessment [July 16]**

**Guest Speaker: Gordon Gillerman, U.S. National Institute of Standards and Technology**

- Testing, Certification, Conformity Assessment

**10. Strategic Standards Management [July 23]**

**Guest Speaker: William E. Kelly, P.E., Ph.D. (former Dean, Catholic University School of Engineering)**

11. 8 Class Presentations [July 30]

12. 8 Class Presentations [August 6]

### 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 the first day of examinations. Note: *please review the research paper writing samples.*

**Class Presentation (10%):** The class presentation must be a power point presentation which lasts 10-15 minutes and is based upon the research paper.

**Discretionary points:** attendance (1 point), participation (1 point), preparation (1 point)\