1. **Course Number and Name**
   – EMSE 6992-80, *Global Connections: Standards in Technology, Business & Public Policy*
   – Spring 2016

2. **Administrative Information and Contact Hours**
   Name of instructors: Mr. Joseph Cascio, Esq., and Dr. Stephen Crawford, PhD
   Course credits: Three credit hours
   Time: 2.5 hours/session, one session/week, 6:10 – 8:40 PM, 15 weeks
   Location: Lehman Auditorium, Science and Engineering Hall, 800 22nd St. NW
   Submit work electronically to Professors Cascio and Crawford by email: cascio@gwu.edu; Crawford@gwu.edu
   Office Hours: Cascio -- Tues: 4-6 pm (Tompkins Hall, Suite 103). (202) 994-3005
   Crawford – Thur: 4-6 pm (Media & Public Affairs Building, Suite 625). (202) 994-5365

3. **Emergency Information**
   -- Students should check the GW Campus Advisories web site at:
   http://www.campusadvisories.gwu.edu/index.cfm for current information related to campus conditions, closures, safety information and any other information concerning events that may disrupt normal operations. You may find it convenient to register in the GW Banner system to receive emergency alerts, notifications and updates sent to the GW email addresses. If individuals elect to receive these alerts on a mobile device, they may log on to GWeb Information Web Site at https://banweb.gwu.edu and update their contact information to include mobile devices.
   -- If instructors fail to arrive for the class at the designated starting time and have not notified the class of a late starting time or cancellation, students should wait in the classroom for at least 15 minutes before departing. One member of the class should be selected to notify the EMSE Department of the instructors’ absence by calling the EMSE Department at 202-994-7541 on the next business day.
   -- All students should familiarize themselves with the emergency evacuation routes from our classroom. Pay particular attention to understanding how to egress if all power is out and there is no light. In the event of an emergency evacuation of the class building, students are to assemble at the northwest corner of 23rd and H Streets, N.W.

4. **Course Description, Goal and Objectives**
   *What are standards and why care about them?* Standards are agreed-upon ways of doing something – of making a product, managing a process, delivering a service or supplying materials.¹ In our technologically advancing and connected world, they increasingly shape the competitiveness of firms and economies, the health of individuals and complex systems (energy, trading, financial reporting), and the fate of the planet. Yet, few business managers, government officials or those who advise them know much about the standardization process for voluntary, consensus standards and who creates them, much less how to get involved in order to shape them and take full advantage of their existence. This inter-disciplinary, graduate-level course addresses that gap by teaching the knowledge and skills needed to operate effectively and

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¹ To be more precise, standards are published documents that spell out the specifications and procedures that ensure the safety and reliability of the materials, products, methods, and/or services people use every day.
provide leadership in the standards arena. It gives special attention to the exciting potential for voluntary consensus standards to promote prosperity and safety at a time when governments find it difficult to act.

**Learning Goal**
The overarching learning goal of this course is to introduce you to the mildly esoteric but exciting world of standards, standards organizations and standards development in a way that leaves you knowledgeable about their key factors, prepared to apply that knowledge in professional settings including those for creating standards, and motivated and well-equipped to continue learning on your own. The learning objectives below represent more specific dimensions of the goal, organized around basic questions about standards.

**Learning Objectives**
*What are standards and what do they do?* Technology standards control access to markets, and thus play a critical role in the fortunes of firms and countries. By the end of this course, you will be able to explain standards, the wide range of subjects they cover, and the different types that exist for different purposes, with special attention to voluntary, consensus standards.

*Why do we need standards?* There are many answers, from making sure spare parts fit, to ensuring that transmitters and receivers work together, to protecting children from toxins in toys. By the end of this course you will be able to explain how standards promote consumer and worker safety, economic development and environmental sustainability, and why they are sometimes controversial.

*Where do standards come from and how are they enforced or revised?* By the course’s end, you will be able to explain the existing industrial, national and international institutions for developing standards and for assessing and enforcing conformity with them. You will have opportunities to meet with senior executives at the American National Standards Institute (ANSI), the National Institutes for Standards and Technology (NIST), and other leading standards bodies.

*How can I use such knowledge in my career?* By the course’s end, you will be able to identify and explain the need for a new standard or risks posed by a proposed one, support the development and consensus negotiation of an appropriate standard, and assist with its implementation and/or enforcement in your professional setting. You will be able to assess and show how standardization does or would affect corporate strategy, product design, and management systems. For those in public policy, you will be able to evaluate the need for and implications of new standards and the challenges of attaining agreement on them.

*How else might I use such knowledge?* You will also gain deeper insight into the challenges of ensuring prosperity, safety and sustainability in an increasingly complex world. And you may come to care about the potential of private, consensus-based processes for making needed rules about emissions, trade, financial reporting, product and worker safety and much more in a world where governments are often unable to do so. Such insight and caring may affect your personal decisions about career choice and volunteer activities.

**Pedagogical Approach**
This course is premised on the belief – one backed by much evidence -- that learning is most effective when it is active. Therefore, lectures will be few and brief, discussion and group projects will be serious endeavors, and the professors will act more as guides by your side than sages on a stage. You will have an opportunity to shape the course as it unfolds, but should expect in turn to take some responsibility for its success.
Your professors bring much relevant experience to your community of learners. An engineer and lawyer by training, Joe Cascio is an experienced consultant on management systems based on ISO standards and a Visiting Scholar at GWU’s School of Engineering and Applied Science. He worked for 26 years at IBM, chaired the U.S. Technical Advisory Group (TAG) on the ISO-14000 series of environmental management standards from 1991 to 2003, and served as the Federal Environmental Executive with the Council on Environmental Quality in the Executive Office of the President in 2008-09. He has published widely on the role of process standards and conformity assessment of environmental management systems.

Steve Crawford is a Research Professor in GWU's Institute of Public Policy. Previously he worked as a senior manager at Brookings, the National Governors Association, and in Maryland State government, as well as a college professor. Currently he directs a major project on developing and operationalizing standards for defining labor-market credentials. He is a member of the board of the American National Standards Institute, and awaiting Senate confirmation of his nomination by President Obama to serve on the U.S. Postal Service’s Board of Governors.

The students in this class bring a wealth of professional and personal experience of their own. By working collegially and collaboratively, just as in professional settings, we will be able to achieve the learning objectives set out above for this course.

**Text Book and References**


b. Course reading list contains additional references to be assigned with lessons at the discretion of the instructors

**5. Course Topics**

This course envisions fourteen learning sessions in a three credit academic offering. Most sessions will be enriched by a guest lecturer who has exceptional experience in the topic being covered. The course sessions include:

1. Historical perspective and value of standards:
   a. Illustrate with a sampling of standards from antiquity through industrialization, World War II, the post-war decades and the last few decades’ revolution in information and communications technology
   b. Discuss the influence of military specifications to other standards
   c. Discuss the genesis and advantages of standards for the industrial era
   d. Present anecdotes on the contributions of Deming, Juran and other leaders in standardization
   e. Discuss how quality standards led to a proliferation of management system standards (MSS), many of which treat areas that are “normally” in the province of public authorities
   f. Introduce the case study: *International Standards for Environmental Management*

2. Types of standards, principles and value to society:
   a. Technical standards (mechanical, electrical, Metrical, IT)
   b. Quality processes (scientific management)
   c. Product characteristics (medical devices, labeling, LCA, Design, Buildings)
   d. Management subsystems (Environmental, OSH, Social Responsibility)
   e. Exemplify with: ISO 9000, 14000, 26000, 50001, 45001, others
   f. Case study exercise
3. The U.S. national standards system (I): Private sector
   a. Players, structure, process, checks and balance
   b. ANSI Federation, SDOs, Consortia Groups
   c. Case study chapter

4. The U.S. national standards system (II): Governmental role
   a. NIST, USTR and other Federal agencies
   b. The National Technology Transfer and Advancement Act (NTTAA)
   c. The Standards Development Organizations Advancement Act (SDOAA)
   d. NIST report to the National Science & Technology Council (2011)
   e. Case study chapter

5. The International standards system (I)
   a. Players, structure, process (ISO, IEC, CEN/CENELEC, ITU, Country Member Bodies)
   b. The ISO Technical Management Board
   c. The ISO Central Secretariat
   d. Case study chapter

6. The International standards system (II)
   a. The Vienna Agreement
   b. Relationships with other international bodies (e.g., WTO, ILO, OECD, UN, Member Bodies and Governments, etc.)
   c. Representation of interest groups on committees
   d. Case study chapter

7. The mechanics of standardization (I)
   a. ISO technical committees, subcommittees, work groups (formation, scope of work)
   b. National member bodies (e.g., ANSI) and national mirror groups (e.g., USTAGs)
   c. Strategic Advisory Groups to ISO (e.g., Strategic Advisory Group on the Environment)
   d. Case study chapter

8. The mechanics of standardization (II)
   a. New work item proposals (NWIPs)
   b. National delegations (delegates, experts, operation and rules)
   c. Consensus (Definition, how it is achieved in practice)
   d. Participation in standardization (materially interested parties)
   e. Case study chapter

9. The use of standards (I):
   a. By industry and commercial entities (voluntarily)
   b. For national governmental purposes (DoD, USEPA, FDA, etc.)
   c. Case study chapter

10. The use of standards (II):
    a. For international governance, arrangements, agreements, protocols
    b. Federal policy of incorporation by reference into regulations
    c. Ramifications of incorporation by reference (ramifications for regulation)
    d. Public policy advancement (e.g., Public-policy partnerships, environmental, health and safety (toy and food, cook stoves), and energy (bio-fuels, electric vehicles, nuclear))
    e. Legal uses and issues (copyright, etc.)
    f. Case study chapter

11. Conformity Assessment (I)
    a. How conformity assessment works separately from standardization
    b. Accreditation, Certification, Registration
c. Structure and entities involved
d. Oversight and control nationally and internationally
e. Case study chapter

12. Conformity Assessment (II)
a. Auditing standards (e.g., ISO 19011)
b. Legitimacy and credibility in conformity assessments
c. Qualification and competence of auditors and course providers
d. CASCO guides for accreditation, certification and auditor competence
e. Case study chapter

13. Next Generation Self-Governance

a. What is it?
b. Enablers (technology, voluntary standards, public awareness and involvement)
c. Achieving cultural and operational change in organizations
d. Case study chapter

14. Review and reinforce concepts and principles from previous lessons

6. Case Study and Assessments

In a course about standards, there should be clear criteria and standards for assessing student learning. At the same time, the assessments should encourage deep and enduring learning, and not only about the course material but about your own interests, abilities and best ways of learning. With that in mind, this course offers some choice about what you do to demonstrate progress towards competency in standards and how much the various activities count. Please review the following menu and choose according to the directions. The result will be a contract.

(1) Case Study: The case study will be presented as chapters in a rolling scenario over the thirteen sessions. It will explore the issues and options for the creation of international environmental management standards. We will discuss in class the underpinnings of the types of issues and options available for the creation of such standards in each chapter of the scenario. Students will be divided into small groups and will receive a set of questions at the end of each session. Answers to the questions will reflect their analysis and recommendations to be submitted in written form before the next course session. We will devote the first 30 minutes of each session to reviewing the submissions and discussing their merits.

Issues and options to be considered in the case study chapters may include ones such as:
- What evidence would you expect to be presented as justification for creating separate, unique standards?
- What goals might the advocates for new standards have in mind?
- What expertise would you expect from those that would create such standards?
- Which interest groups would you expect to come forward to participate in creating such standards?

The group submissions will be graded for quality and for the degree of understanding of the international standardization process. Members of each group will all receive the same grade on the case study portion of the course grade (50%).

(2) 3 Quizzes on readings and class instruction, worth 5 points each (15%)

(3) Class Participation/contributions to discussion (learning through discussion) (20%)
(4) Write a 5-page policy brief arguing for or against the adoption of a new standard of your choice (to be approved by instructor) and advising a client (firm, industry association, government agency) on the best strategy to pursue and why (15%)

7. Academic Integrity
Academic integrity is central to the learning and teaching process. Students are expected to conduct themselves in a manner that will contribute to the maintenance of academic integrity by making all reasonable efforts to prevent the occurrence of academic dishonesty. Academic dishonesty includes, but is not limited to, obtaining or giving aid on an examination, having unauthorized prior knowledge of an examination, and plagiarism of all types. Ignorance is no excuse. Nevertheless, collaboration is a good thing, just acknowledge it.

Joe Cascio, Esq.            Stephen Crawford, PhD
GWU, Visiting Scholar      GWU, Research Professor
EMSE (SEAS)                GW Institute of Public Policy