



Promoting Standards Education in North
America – NIST (May 2009)

ASME Standards Education Issues/Approaches

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Director, Education & Professional Development

ASME



ASME Quick Facts

- 125+ years
- 127,000 members
- 27,000 student members
- 200+ Sections
- 500+ Student Sections
- 400+ US & International degree programs (ABET accreditation)





ASME Facts – Global Offices





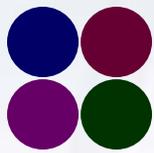
New Challenges

- Biotechnology
- Water management
- Security
- Nanotechnology
- Hydrogen
- Whole-systems thinking
- Bio-convergence
- Energy/Sustainability
- Entrepreneurship
- Innovation

Codes & Standards??

ASME Nuclear Codes and Standards Volunteers

- Approximately 1,000 volunteers
 - 10% from outside U.S. and rapidly growing
 - <5% women but increasing
 - ~1% under age 30 but increasing
 - <5% under age 40 and increasing
 - Vast majority over age 50 with many in their 60s and several in their 70s and beyond
- Presents enormous challenge for recruiting, retention, and knowledge transfer as the nuclear industry is rapidly expanding worldwide



ASME Student Programs



Student Design Competitions



Student Design Expos *(New!)*



Oral Presentation & Poster Competitions



Oral Presentation Competition – Video *(New!)*



Early Career Engineer Forums & Grad Student Technical Conferences



Mechanical Advantage



ME Today



Loans/
Scholarships/
Fellowships



Contribute to the PPC

The PPC is committed to serving the growing and changing needs of students, faculty, early-career engineers, and companies.

We invite faculty, practicing engineers and other professionals to suggest topics for future modules as well as provide module content.

What We Need

- written content
- illustrations and case studies
- audio and video resources
- downloadable supplementary materials
- exercises and practice quizzes
- links to other useful resources
- faculty resources (e.g. slide presentations, guidelines and suggestions for implementation of the modules in engineering courses, etc.)

The PPC project staff will provide design, editing, graphics, multimedia and web development as well as collaborate with contributors to help turn materials into effective modules.

To learn more about working with ASME on new PPC modules or enhancing existing modules, please contact us at ppc@asme.org

The ASME Professional Practice Curriculum is available exclusively through ASME and is a joint project of the Center for Education and the Center for Profession Development, Practice & Ethics. ASME gratefully thanks the ASME Foundation and the many authors and contributors for their support.

www.professionalpractice.asme.org

PPC
Online
Professional Practice Curriculum

ASME
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
Three Park Avenue
New York, NY
10016-5110 U.S.A.

Non-Profit Org.
U.S. Postage
PAID
Permit No. 452
Union, NJ

ASME
SETTING THE STANDARD



PPC Online

Professional Practice Curriculum

Online self-study modules for early career engineers and engineering students

www.professionalpractice.asme.org

SETTING THE STANDARD

PPC Online

Professional Practice Curriculum



About the PPC

The ASME Professional Practice Curriculum (PPC) is an online program of study that complements the formal college/university engineering curriculum to help students and early-career engineers be better prepared for entry into and early advancement in the engineering profession.

The PPC is available exclusively through ASME in two different versions: online or downloadable PDFs. The modular content is designed for individual self-study, for assignment in engineering courses at colleges and universities, or for training at companies.

The Modules

Each online self-study module can be completed in approximately two hours.

Visit the website and review the introductions to the 42 modules listed on the next panel. →

The PPC is supported by grant funding, volunteer contributions, and subscription fees, which help us maintain and improve existing modules as well as develop new modules. To inquire about a site license for your university or company, please contact us at ppc@asme.org

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Career Transition

- Studying Engineering
- Graduate Studies
- Introduction to an Engineering Career
- Mechanical Engineering and Multidisciplinary Thinking
- Engineering Ethics

Business & Legal

- Entrepreneurs: Business Planning
- Engineering Public Policy – Policy Gear
- Introduction to Intellectual Property
- Patent Law
- Codes and Standards

Management & Leadership

- Leadership Principles
- Leadership Styles and Attributes
- Team Building
- Management Skills
- Workplace Diversity
- Mentoring

Communications

- Communicating to Non-Technical Audiences
- Conducting Effective Meetings
- Effective Technical Presentations
- Negotiation
- Communication Skills

Project Management

- Project Management
- Project Controls
- Contracting Organizations and Options

Entrepreneurial

- Business Incubators
- High Tech Startups

Engineering Design

- Conceptual Design
- Analytical Design
- Parametric Design

Product Management

- Product Planning
- Product Development
- Product Management
- Systems Engineering
- Safety and Risk Assessment

Sustainability

- Sustainability: Intro
- Sustainability: Engineering Tools

Writing Winning Proposals

- An Introduction
- The Technical Proposal
- The Cost Proposal
- Grant Writing for Engineers

Sales and Marketing for Engineers

- Sales for Engineers
- Marketing Technical Products

Connection to ABET Criteria

ASME is committed to helping colleges of engineering guide the development of students and teach the principles of engineering practice and professionalism without overburdening an already full undergraduate curriculum. The modules cover a diverse array of topics, many pertaining to the ABET accreditation criteria, and they are designed to be suitable for student assignment, where appropriate, in engineering courses.

Many of the modules contain content that may be used to help satisfy the ABET criteria on program outcomes and assessment (Criterion 3, a-k). For example, some of the modules may be assigned as reading with follow-up quizzes as assessment that can be used to help demonstrate students'

- ability to design within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- ability to function on multi-disciplinary teams
- understanding of professional and ethical responsibility
- ability to communicate effectively
- knowledge of contemporary issues

For more details on which modules may satisfy ABET's Criterion 3, a-k, please visit the "For Faculty" page on the PPC website.

PPC Online

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300,000 Site Visits

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Entrepreneurial

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- Codes and Standards

Management & Leadership

- Leadership Principles
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- Management Skills
- Workplace Diversity
- Mentoring

Communications

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- Product Planning
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health and safety, manufacturability, and sustainability

- ability to function on multi-disciplinary teams
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**Introduction to an Engineering Career**

Resources



Quiz



Faculty



Glossary

Introduction

You have accepted your first job, and shortly, will start working and begin your career as a practicing engineer. (For information on the job search process, check out the module

Educational Goals:

After completion of this module, you will learn:

- How to prepare for the transition from student to engineer
- How to cope during your first months on the job
- How to make a good first impression
- How to handle certain on-the-job situations
- How to prepare and position yourself for advancement



Audio Video Transcript
Selecting a company - Jose Ibanez, FMC/United Defense

Audio Video Transcript
Value of an engineering degree - Beth Lemen, Proctor & Gamble

[back to menu](#)

* Introduction

1 The First Day

2 Attendance & Appearance

3 Your Supervisor

4 Your Co-Workers

5 Learning & Doing Your Job

6 Training & Continuing Education

7 Working as an Engineer: Non-Technical Aspects

8 The Performance Review

9 Positioning Yourself for Advancement

10 Summary

“Introduction to Codes and Standards” Module



HOME SEARCH JOIN SHOP HELP

PPC Home | How It Works | Module Listing | For Faculty | Contributors | Feedback | Contact Us

PPC Online
Professional Practice Curriculum

Codes & Standards

Resources Quiz Faculty Glossary

Introduction

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- Introduction
- Codes vs. Standards
- Codes and Standards Today
- ASME's Role in Codes and Standards
- Conformity Assessment
- Global Issues in Standards Development
- Challenges Facing the United States
- Conclusion

In 1904, more than 1,500 Baltimore buildings were destroyed in a fire that burned for 30 hours. Fire companies from as far away as New York came to help, but many of them were useless because their hose couplings did not fit the Baltimore hydrants, and differed from each other's. It was just one of many events that made clear the need for codes and standards.

ASME turned its attention to standards in the early 1880s. In 1883, it formed a committee on standards and gauges, and in 1884 the organization published its first uniform test code on boiler tests. Soon after, the organization decided that pipes and pipe threads should also be standardized.

It was not until 1915, however, that ASME first published its Boiler and Pressure Vessel Code, which was written to address the problem of exploding boilers. This code has become law in 49 U.S. states, in Canada and in 60 other countries throughout the world.

Educational Goals:

- Understand the difference between codes and standards, and the difference between performance and design standards
- Understand the importance of codes and standards in engineering
- Be familiar with the standards development process, and ASME's role in it
- Know the six steps of conformity assessment
- Be familiar with

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2,500 Site Visits (<1%)

- understanding of professional and ethical responsibility
- ability to communicate effectively
- knowledge of contemporary issues

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ASME Graduate Student & Post-Doc Opportunities

...for the next generation of leaders

- TECHNICAL RESOURCES
- ASME JOURNAL SUBSCRIPTIONS
- ASME ELIBRARY
- ASME CONTINUING EDUCATION INSTITUTE (CEI)
- PROFESSIONAL RESOURCES
- ENTREPRENEURIAL RESOURCES/OPPORTUNITIES
- ASME ONLINE VIDEO/AUDIO LIBRARY
- FELLOWSHIPS
- TECHNICAL PAPER, GRANTS AND OTHER AWARDS
- TECHNICAL CONFERENCES REGISTRATION DISCOUNTS
- ASME FINANCIAL AID
- NETWORKING & JOB SEARCH
- INSURANCE & OTHER MEMBER DISCOUNT PROGRAMS



ASME Grad Student Center

go.asme.org/Gradstudents

ASME Continuing Education Institute (CEI)

ASME is a recognized as leader in technical training for engineers and other technical professionals. CEI short courses (live/online/webinar) combine academic rigor with contemporary field applications in industry. **Get 50% registration fee discounts for full-time graduate students.**

Biotechnology and Pharmaceutical Technology - The basic science of biotechnology and valuable tools for solving bio-process and production problems plus technical and regulatory aspects of bringing products to market successfully.

Boilers, Pressure Vessels and Piping Courses - B31.1 Process Piping, B31.3 Power Piping Design, Section VIII Pressure Vessel Design and Fabrication, and Section IX Welding and Brazing.

Chemical Essentials - Fundamental theories and practices of chemical engineering for non-chemical engineers, chemists, research engineers, and plant operation personnel.

Design, Manufacturing and Materials - Geometric dimensioning and tolerancing, the ASME Y14.5 standard, fracture mechanics, six sigma, and finite element analysis.

Elevators and Escalators - ASME elevator codes and standards, courses provide insight into maintenance and evaluation, control technology, inspection, safety and emergency evacuation.

Emerging and Alternative Power Technology - Applications of fuel cells, as well as renewable and clean energy.

Engineering Management - Leading teams, project and

Entrepreneurial Resources/Opportunities

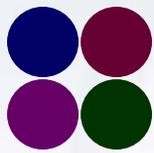
ASME Center for Engineering Entrepreneurship and Innovation (CEEI)

CEEI is the gateway for innovative thinkers providing both entrepreneurial content and access to resources such as funding, financial consulting, intellectual property expertise, and human capital advice.

ASME Innovation Showcase (I-Show) – Awarding \$20,000 in seed funds

ASME's I-Show provides a platform for top graduate and undergraduate student teams to compete for seed money to commercialize their idea before a judging panel of successful innovators, industry experts, venture capitalists, and intellectual property specialists.





ASME Center For Education

Degree Program
Accreditation (ABET)

Department Heads
Committees &
Network

Strategic Issues
Research

Faculty Workshops
Faculty Webinars (coming)



MEDH Global Listserv (*restricted*)

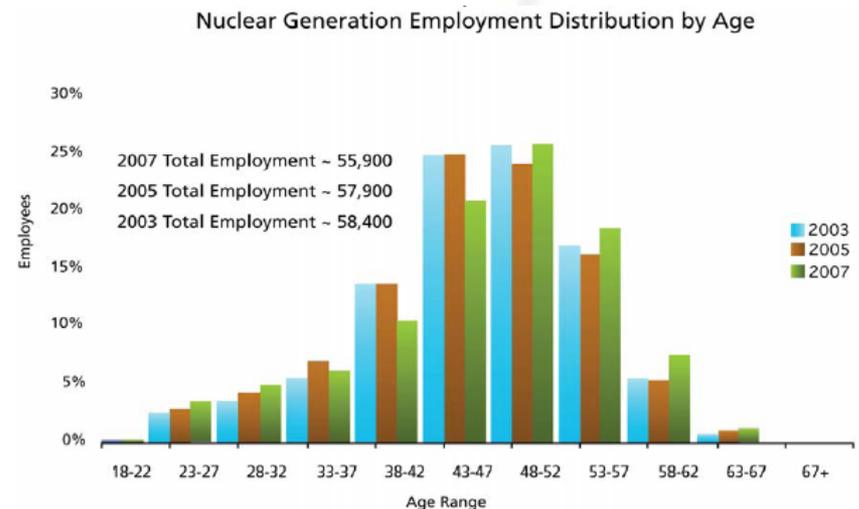
500+ Department Heads

asme_me_dept@list.asme.org

U.S. Nuclear Industry's Aging Workforce

- Median age of the 56,000 workers is 48 years
- 58% of engineers at nuclear utilities are over 48 years old
- 35% of the workforce could retire in the next 5 years
- Hiring was extremely low or non-existent for many years (late 1970's to early 2000's)
- Hiring has started, being led by the nuclear steam supply system vendors

Source: NEI Work Force Report, December 2007



ASME BNCS Education Initiatives

Meetings at Universities

- University of Pittsburgh – School of Engineering – October 17-19, 2006
- University of Colorado at Boulder – September 18-19, 2007
- Vice President interface with Big 12 Nuclear Engineering Program – September 14-15, 2008
- Georgia Institute of Technology and SUNRISE (Southeast Universities Nuclear Reactors Institute for Science and Education) – October 2-3, 2008

Formation of ASME BNCS Task Group on Nuclear Education and University Relations

Mission

- Support incorporation of technology for Nuclear Codes & Standards into Continuing Education and engineering curricula
- Build relations with engineering school faculty and administration to provide technical support to nuclear industry related research programs

ASME Participation with Universities in Key Initiatives

- *University of Dayton Research Institute* – Lead Investigator – Task 1 - Alloy 800H and Grade 91 Allowables for ASME Gen IV New Reactor Materials Project sponsored by DOE
- *University of Michigan*
Cooperative research projects under DOE Nuclear Energy Research Initiative (NERI)
- *University of Pittsburgh*
Class “Introduction to Nuclear Codes & Standards and Regulatory Endorsement” delivered as part of *Integrated Nuclear Systems & Components* engineering graduate class
- ***Southern Polytechnic State University***
Nuclear Construction & Startup Curriculum

Getting Nuclear Codes & Standards Technology into Engineering Curricula

- ASME Continuing Education Institute (CEI) has courses ready or under development
 - Section III and XI, NQA, PRA and Sections VIII and IX
- Model exists between ASME CEI, Boeing and Kansas State University
 - ASME on-line classes audited by Kansas State and reviewed for Undergraduate credits
 - Boeing employees take classes and entitled to get either Undergraduate credits or Continuing Education Units
- Similar approach could be used for Codes & Standards for participation by one or many universities
- Could also have branded portal (or url page) for each university



Undergraduate Design Topics Pertaining to ASME C&S

1. Fatigue Analysis using ASME Elliptic Relationship
2. Screw threads, bolts and screws B18 and B16
3. Welding Joint and Joint Integrity- Section IX
4. Rolling and Fluid Bearings
5. Reliability and Risk Analysis
6. Power Transmission- gears belt and chain applications
7. Pressure Vessel Design- (e.g. Guidebook for the Design of ASME Section VIII Pressure Vessels, Third Edition)



“If we build it, will they come?”