Welcome to the SES May 2020 Webinar
“Exploring Innovations in College and University standards education”

May 20, 2020
1:00 - 2:00 pm Eastern

Margaret Phillips, MLS, Assistant Professor, Rochester Institute of Technology
Lisa Greenwood, Ph.D., ISSP-SA, Assistant Professor, Purdue University
Bryan Hoskins, Ph.D., P.E. Associate Professor, Oklahoma State University
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Standards in the Curriculum @ RIT:
Civil Engineering Technology
Environmental Management, and Safety

SES Webinar:
Exploring Innovations in College and University standards education

May 20, 2020

Lisa Greenwood
Rochester Institute of Technology
Overview

• RIT’s CETEMS Programs
  • Our programs
  • Our approach to standards in the curriculum

• NIST curricular grant project
  • Approach
  • Outcomes

• Future plans
CETEEMS Department Programs

Civil Engineering Technology
- B.S. Civil Engineering Technology
- M.S. Construction Management

Environmental Management & Safety
- B.S. Environmental Sustainability, Health & Safety
- M.S. Environmental, Health and Safety Management
Program Goals & Approach

• Practitioner-oriented education
• Industry-driven standards content
• Graduates are prepared to
  • apply discipline-specific knowledge, strategies, skills & modern tools to solve societal challenges
  • apply discipline-specific principles, practices, and skills to advance the industry, and help lead organizations toward sustainability
  • Pursue professional certifications and licenses
    • PE, LEED AP, CHMM, QEP, CSP, CIH, ISSP-SA

Standards are CRITICAL!
## Approach

<table>
<thead>
<tr>
<th>M.S. in EHS Management</th>
<th>EHS, CET B.S. Programs &amp; M.S. in Construction Mgmt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core course sequence structured around ANSI/ISO EHS risk standards + Technical courses based on regulatory and industry standards + Application of standards in assignments and projects</td>
<td>Applicable regulatory, industry, engineering, and sustainability standards incorporated into course curricula + Application of standards in assignments and projects</td>
</tr>
</tbody>
</table>
PDCA Curriculum Overlay
M.S. in EHS Management

- EHS Internal Auditing
  ESHS 780

- Corporate Social Responsibility
  ESHS 755

- EHS Management System Design
  ESHS 740

- Integrating EHS into the Business
  ESHS 760

Approach

Act

Plan

Check

Do

RIT College of Engineering Technology
## NIST Project Scope & Objectives

### Scope:
Integrating ISO risk-based standards into curricula for EHS, Civil Engineering & Construction Management

### Objectives:
- Enhance student grasp of the application of risk management systems standards
- Provide coordinated view of the scope of risk
- Develop a portable, modular approach for standards education

<table>
<thead>
<tr>
<th>STD</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ISO 14001</td>
<td>Environmental management framework for organizations to manage environmental responsibilities, enhance environmental performance, maintain legal compliance</td>
</tr>
<tr>
<td>ISO 45001</td>
<td>Occupational health and safety management framework for organizations to improve health and safety performance and prevent injury and ill-health.</td>
</tr>
<tr>
<td>ISO 37101</td>
<td>Community sustainable development framework for improving the contribution of communities to sustainable development and enabling them to achieve their vision with regard to sustainability</td>
</tr>
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### Module Template

**Course Template**

| A. Module Roadmap | a. Introduction and overview of module - executive summary  
b. Connection to course intended learning outcomes, module learning objectives, description of module, rationale for module |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------|
| B. Standard Overview | c. Summary of standard  
d. Scope of standard |
| C. Educational Content | e. PowerPoint Slides / Lecture Notes  
i. Provides context for student  
f. Resources/ Supporting Links  
i. Readings  
ii. Supplementary materials  
iii. Links to online tools and materials  
g. FAQ  
i. Answers to frequently asked questions by students  
h. Example Discussion Questions  
i. Promotes student participation and communication of material  
i. Assignments and Exercises  
i. Example assignments and questions  
ii. Hands-on exercises for students to apply knowledge of material |
| D. Module Assessment | A. Assessment tools for the student and instructor in order to measure achievement of learning outcomes and module effectiveness |

This educational content was prepared by RIT under award 70NANB16H268 from the National Institute of Standards and Technology, U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the National Institute of Standards and Technology or the U.S. Department of Commerce.
Project Outcomes
# Incorporation in the Classroom

<table>
<thead>
<tr>
<th>Course Standards Content</th>
<th>Modules</th>
<th>Over-view</th>
<th>Context &amp; Stakeholders</th>
<th>Leadership &amp; Oversight</th>
<th>Risk ID</th>
<th>Clauses and Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVET 505 Sustainable Building Design</td>
<td>37101</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESHS 515 Corporate EHS Management</td>
<td>14001, 45001</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESHS 500 Social Responsibility &amp; Env. Sustainability</td>
<td>37101</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>ESHS 720 EHS Management</td>
<td>14001, 45001</td>
<td>✔️</td>
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<td>✔️</td>
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<tr>
<td>ESHS 740 EHS System Design</td>
<td>14001, 45001</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>ESHS 760 Integrating EHS in the Business</td>
<td>14001, 45001</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
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</table>
• ISO 14001 & 45001 incorporated more broadly in other courses in EHS Management & Environmental Sustainability, Health & Safety programs at RIT

• ISO 37101 content incorporated into Construction Management M.S. program

• Modified module content disseminated in industry outreach/workforce development efforts
Measures of Success

Feedback & Testimonials

From Instructors: “All students appeared to grasp concepts well and were able to successfully apply them to the project ...”

“Students ... seemed to enjoy knowing that they ‘get’ this concept because they continued to use it – and use it correctly - in subsequent assignments.”

From Students:

“[The professor] did a great job of teaching the concepts of ISO...management systems. She used the discussions and homework assignments to solidify that knowledge ... [and] communicated the information in a way that made it very easy to grasp and commit to memory.”

“[Appreciated the] ... hands-on experience with ISO, homework that challenged us to dive deeper into concepts.

“[Standards-related] discussions were helpful and gave a better understanding of subject matter.”

<table>
<thead>
<tr>
<th></th>
<th>37101 Module</th>
<th>14001 Module</th>
<th>45001 Module</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Touches</td>
<td>52</td>
<td>279</td>
<td>279</td>
<td>598</td>
</tr>
<tr>
<td>Percent Achieving ≥ 80%</td>
<td>89%</td>
<td>96%</td>
<td>96%</td>
<td></td>
</tr>
</tbody>
</table>
Questions?

Contact:
Lisa Greenwood

lisa.greenwood@rit.edu
Exploring an Information Literacy Approach to Standards Education

Prof. Margaret Phillips
Society of Standards Professionals (SES) webinar | May 20, 2020

This project was funded by the NIST Standards Services Development Cooperative Agreement Program award 70NANB16H261.
Overview

• Meet the research team
• Background
• Project objectives
• Project outcomes
• Where to learn more about this project
• References
Research Team

Margaret Phillips
Assistant Professor of Library Science
Engineering Information Specialist
Purdue University Libraries

Michael Fosmire
Professor of Library Science
Head, Physical Sciences, Engineering, and Technology Division
Purdue University Libraries

Paul McPherson
Assistant Professor of Practice
Mechanical Engineering Technology
Purdue Polytechnic Institute
Background

• Purdue Libraries & School of Information Studies – MET Program partnership

• MET 102 *CAD in the Enterprise* standards assignment

• Faculty discomfort
  • 49% of survey respondents reported “lack of faculty expertise” as an impediment to teaching about standards *(Khan, Karim, & McLain, 2013)*
Project Objectives

• Develop an open-access, introductory-level, interactive online standards education program

• Provide micro-credentials for students to demonstrate standards competence to potential employers, etc.
Project Outcomes

**Tutorial Modules**

1. **Introduction (0:07)**
   
2. **Module 1**
   - An overview of standards for research (10:41)
   - The role of standards in research (12:57)

3. **Module 2**
   - Anatomy of a standard (10:56)
   - Standards for research (12:57)

4. **Module 3**
   - Discovering and Locating Standards (13:37)
   - Standards for research (12:57)

5. **Module 4**
   - Standards in Everyday Objects (14:41)
   - Standards for research (12:57)

**Purdue University Standards Case Studies**

- Search for standards case studies created by undergraduate engineering technology students
- Standards Research Suite: https://guides.lib.purdue.edu/NIST_standards

**Badges Platform**

- To demonstrate your expertise with standards, you can complete either or both of these badges.

- **Standards Explorer** is a Developing level badge, indicating mastery of basic principles of technical standards.

- **Standards Integrator** is a Proficient level badge, indicating the ability to apply information from technical standards to make decisions.

- **Google Search** for Purdue University standards case studies.

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- **~750 undergraduate Purdue engineering technology and materials engineering students** reached since Fall 2017; additional engineering faculty and students (~130) at the University of Buffalo
- **79 students** – submitted materials to earn badges; **25 badges** awarded to date
- **Three workshops conducted on project materials:** **79 attendees** from **35 institutions**
Where to Learn More

• Project website: [http://guides.lib.purdue.edu/NIST_standards](http://guides.lib.purdue.edu/NIST_standards)

• Publications related to the project:
  


References

Understanding the Significance of Integrating Codes & Standards into the Learning Environment

BRYAN HOSKINS, PHD, PE (BRYAN.HOSKINS@OKSTATE.EDU)
Codes and Standards in Fire Protection Engineering

- Unique discipline
  - Codes and standards in the undergraduate curriculum

- Essential to the industry

- Students do not understand
  - Within major
  - Within associated fields

- People that come into the field do not understand

- Need improved understanding and resources
Emergency Egress Standards

https://www.youtube.com/watch?v=9bKLrl_CBHo
Project Background

➢ Lack of Understanding about Codes and Standards
➢ Video Modules for Classroom Use
➢ Explain the Role of Various Codes & Standards
➢ Explain the Consensus Process in Code & Standard Development
Local Amendments

- Codes and standards adopted by edition
  - Not automatic
  - Changes
- AHJ has final say
Video Effectiveness

➢ Pretest/Posttest
  ➢ 5 Questions
  ➢ Tied to the Learning Objectives
  ➢ Pretest Average: 2.7 (both video & lecture)
  ➢ Posttest Average: 4.1 (video) & 4.2 (lecture)
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**Student Membership:** For college students preparing for a career working with standards. Receive the bimonthly journal, Standards Engineering, attend conferences and training courses at reduced rates, and take advantage of professional growth opportunities. Student Membership is only $15 per year!

Visit [www.ses-standards.org](http://www.ses-standards.org) for more information!
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https://twitter.com/SES_Standards
Annual SES Conference Postponed until 2021 we will be looking at a virtual conference for 2020

69th Annual SES Conference

Charleston, South Carolina - August 3-5, 2020

Postponed until 2021
Your Feedback is Requested

Thank you for attending today’s webinar

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