LSC Use Only Proposal No:	UWUCC Use Only Proposal No: 11-536
LSC Action-Date:	UWUCC Action-Date: App - 12/13/11 Senate Action Date: App-01/24/12

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person(s)	Email Address
Mr. Eric Nelson	e.r.nelson@iup.edu
Proposing Department/Unit	Phone
Safety Sciences	7-3800

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

1. Course Proposals (check all that apply)

_____ New Course _____ Course Prefix Change _____ Course Deletion

__X__ Course Revision _____ Course Number and/or Title Change __X__ Catalog Description Change

Current course prefix, number and full title: ***SAFE 211 Principles of Safety II – Construction*** · Industry

Proposed course prefix, number and full title, if changing: _____

2. Liberal Studies Course Designations, as appropriate

_____ This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

_____ Learning Skills _____ Knowledge Area _____ Global and Multicultural Awareness _____ Writing Intensive (include W cover sheet)

_____ Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)

_____ Global Citizenship _____ Information Literacy _____ Oral Communication

_____ Quantitative Reasoning _____ Scientific Literacy

3. Other Designations, as appropriate

_____ Honors College Course _____ Other: (e.g. Women's Studies, Pan African)

4. Program Proposals

_____ Catalog Description Change _____ Program Revision _____ Program Title Change _____ New Track

_____ New Degree Program _____ New Minor Program _____ Liberal Studies Requirement Changes _____ Other

Current program name: _____

Proposed program name, if changing: _____

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)	Dr. Jan K. Wachter Jan K Wachter	9-13-2011
Department Chairperson(s)	Dr. Lon Ferguson Lon H. Ferguson	9-15-2011
College Curriculum Committee Chair	Dr. Jan K. Wachter Jan K Wachter	10-20-2011
College Dean	Dr. Mary Swinker Mary E. Swinker	10/21/11
Director of Liberal Studies (as needed)		
Director of Honors College (as needed)		
Provost (as needed)		
Additional signatures (with title) as appropriate:		
UWUCC Co-Chairs	Gail S Sechrist	12/13/11

Received

OCT 24 2011

Liberal Studies

Course Revision: SAFE 211 Principles of Safety II – Construction Industry

Part II. Description of the Curriculum Change

1. Syllabus of Record.

   The new syllabus of record for this revised course is attached in Appendix A.

2. A summary of the proposed revisions:

a. The course has been reduced from a 4 credit course to a 3 credit course. This change is reflected as a reduction in lecture hours per week from 3 to 2 hours. Some course topics have been eliminated to reduce class lecture time. Curriculum mapping has been completed to ensure topics eliminated in SAFE 211 are addressed in other department courses.

b. Upgrades in laboratory exercises combine new lecture material and new laboratory equipment to increase student engagement with subject matter through interactive planning and workplace scenarios using actual field equipment in a controlled laboratory environment.

c. Additional topics have been added to this course, specifically, more information on construction, new crane and rigging guidelines and electrical safety awareness to include safe work practices when on, or around, energized electrical equipment.

d. The bibliography has been updated.

e. Course description has been changed to reflect the above revisions.

   <u>New Course Description</u>

   SAFE 211 Principles of Safety II – Construction Industry 2c-31-3cr

   Prerequisite: SAFE 101

   Develops an understanding of hazard recognition, evaluation, prioritization and control of critical workplace hazards associated with construction. Students are exposed to the complexity of three dimensional work which exists in the fast paced construction industry by thoroughly examining elements of safety and health enumerated in the Occupational Safety and Health Administration standards and in various consensus standards. Emphasis is placed on personal protective equipment, electrical safety, scaffolds, fall protection, trenches and confined space entry including rescue. Practical application of associated hazards and their control strategies is accomplished in laboratory sessions.

Old Course Description

SAFE 211 Principles of Safety II – Construction Industry (3c-31-4cr)

Prerequisites: SAFE 101

Stresses an understanding of the complexity of the construction industry and the hazards common to construction. Focuses on the recognition, evaluation, and control of these hazards with an emphasis on welding and cutting, fall prevention, confined space, materials handling, electrical safe work practices, scaffolding, and trenching. The application of hazard control strategies is accomplished in laboratory sessions.

3. Justification/rationale for the revision.

   This is a revision to an existing course as part of a Safety Sciences Program revision required as part of our ABET accreditation. Changes reflect the recommendations of the Safety Sciences Advisory Board and Safety Sciences Faculty based on results of meetings to identify areas of improvement in the department and to keep the course content current with professional practice. Some course content was moved from the course (reducing course credits from 4 credits to 3 credits) to be better aligned with topics covered in other existing and new SAFE courses.

4. The old syllabus of record.

   The old syllabus of record is attached in Appendix B.

5. Liberal Studies course approval.

   These changes do not affect the Liberal Studies requirements.

Part III. Letters of Support or Acknowledgement

These course changes will not affect other departments, therefore letters of support from other departments were not obtained.

Appendix A: New Syllabus of Record

I. Catalog Description

Course Title: SAFE 211 Principles of Safety II – Construction Safety — 2 class hours, 3 lab hours

Prerequisite: SAFE 101 — 3 credit hours (2c-31-3cr)

Develops an understanding of hazard recognition, evaluation, prioritization and control of critical workplace hazards associated with construction. Students are exposed to the complexity of three dimensional work which exists in the fast paced construction industry by thoroughly examining elements of safety and health enumerated in the Occupational Safety and Health Administration standards and in various consensus standards. Emphasis is placed on personal protective equipment, electrical safety, scaffolds, fall protection, trenches and confined space entry including rescue. Practical application of associated hazards and their control strategies is accomplished in laboratory sessions.

II. Course Objectives

Students will be able to:

A. Demonstrate a fundamental understanding of construction safety.

B. Identify and apply construction-related regulatory safety standards and consensus standards.

C. Apply and demonstrate key hazard recognition concepts associated with workplace exposures during critical stages of the construction process.

D. Apply and demonstrate key hazard control concepts associated with workplace exposures during critical stages of the construction process.

E. Develop knowledge of contemporary safety, health, and environmental issues within a global and social context based on the approaches, expectations and working standards other nations implement as part of a competitive global marketplace.

III. Course Outline

A. Occupational Safety and Health Standards (1926) (2 hours)

1. Application and Use of OSHA standards
2. Enforcement Methods
3. Computer Search Methods
4. Interpretation of Standards
5. Consensus standards

B. Personal Protective Equipment (2 hours)

1. Identifying Needs and Limitations
2. Maintenance and Inspection Programs
3. Selection and Training Programs
4. 29 CFR 1926.95-.107,1910 Subpart I

C. Electrical Safety (4 hours)

1. Principles of Electricity
2. Elements of Electrical Equipment
3. Choosing Electrical Equipment for Hazardous Locations
4. Lockout / Tagout Procedures
5. Electrical Power Transmission
6. Wiring and its Associated Hazards
7. Switches/Ground Fault Circuit Interrupters
8. Electrical Grounding as a Safeguard
9. Electrical Test Equipment

E. Permit Required Confined Spaces (PRCS) (3 hours)

1. Regulations Governing Spaces
2. Space Classifications
3. Permitting
4. PRCS Program Elements

Midterm (1 hour)

F. Cranes and Rigging (4 hours)

1. Hazards with Hoists, Cranes, Derricks
2. Nomenclature and Operation
3. Chain and Sling Rigging Hazards
4. Maintenance, Inspection, and Training

G. Trenching (4 hours)

1. Significance of Exposure
2. Mechanics of Collapse
3. Soil Classifications
4. Safeguarding-Sloping, Shoring, Shielding
5. Regulations Governing Operations

H. Scaffolds and Ladders (4 hours)

1. Types of and Use of Scaffolds
2. Identifying Typical Hazard Exposures
3. Stairways, Ramps, Catwalks

4. Regulations Governing Operations and Hazard Control

I. Fall Protection and Prevention (4 hours)

1. Significance of Exposure
2. Physics of Falls-The Human Experience
3. Options for Protection
4. Regulations Governing Fall Protection

Final culminating activity (during final exams week) 2 hours

Laboratory Exercises (42 hours, each at 3 hours)

The following laboratory exercises are an integral part of the course, giving the students an opportunity to observe and apply many of the construction safety concepts first hand, at appropriate times during the course. For the majority of safety topics, students evaluate actual workplace fatalities, apply established workplace standards and develop a work practice control which would prevent the fatality.

The specific laboratory exercises include:

1. Hazard Assessment, OSHA Standards & Writing
2. Personal Protective Equipment (Basic) - Evaluation & Limitations
3. Personal Protective Equipment (Advanced) - Supplied Air & Line Breaks
4. Basic Wiring & Lockout / Tagout
5. Energy Assessment- Control & Multimeter Use
6. Working with Energized Equipment - NFPA 70E
7. Hazard Identification – Walkthrough of an Industrial Facility
8. Scaffolds
9. Trenching & Excavation
10. Fall Protection
11. Global Safety Awareness & Hazard Identification- Field Inspection
12. Cranes & Rigging
13. Confined Space Entry & Rescue
14. Culminating Activity - Hazard ID - Field Inspection

IV. Evaluation Methods

The faculty person assigned to teach this course could be one of several faculty members within the Safety Sciences Department. What follows is an example of the evaluation methods and weighting used by one of those faculty members:

Course Evaluation

Classroom Evaluation

Weighting:

Unit Exams	50 %
Final	10 %
Quizzes	10 %
Homework	20 %
Participation*	10 %

Laboratory Evaluation

Weighting:

Laboratory Reports / Portfolio	60 %
Laboratory Memos	15 %
Culminating Activity	5 %
Quizzes	10 %
Participation*	10 %

*This includes but is not limited to: attendance, individual participation in whole class and small group discussions and other brief class presentations.

No make-up examinations will be given except in the case of illness (confirmed in writing by the infirmary or MD) or a documented (in writing) family emergency. Regardless of reason, absolutely no make-up exams will be given unless the instructor is contacted prior to the scheduled test period.

A. Quizzes

Quizzes may be open book and unannounced. They may be made up of short answer, true/ false, or multiple choice questions.

B. Participation

Students must attend the entire classroom or lab period in order to receive full credit. Students who arrive late to lab, or who leave before the end, will not receive full credit.

C. Laboratory Reports

Laboratory reports, or memos, will be prepared for most sessions and will follow a specific format as provided in the SAFE 211 LAB REPORT GUIDELINES. Report grades will be based on accuracy, completeness and originality.

D. Portfolio

A minimum of two (2) improved versions of laboratory activities must be presented in a portfolio suitable for a job interview. These pieces should (1) demonstrate ability to work with others, (2) ability to identify, evaluate and control hazards, and (3) computer skills. Grading will be based on the portfolio's

professional appearance, organization, timeliness, evidence of the above three items, evidence of improved work, and a reflective statement.

V. Example Grading Scale:

A=90-100%
B=80-89%
C=70-79%
D=60-69%
F= <60%

At the discretion of the instructor, a grading curve that results in an appropriate distribution of grades may be used in place of the scale described above.

VI. Attendance Policy

The undergraduate course attendance policy will be consistent with the university undergraduate attendance policy included in the Undergraduate Catalog.

VII. Required Text

Hill, D.C. (2004). *Construction Safety Management and Engineering*. Des Plaines, Illinois: American Society of Safety Engineers.

Code of Federal Regulations 29 Parts 1926 Construction: OSHA Standards (Current Edition). Davenport, Iowa: Mancomm.

VIII. Special Resource Requirements

None

IX. Bibliography

ANSI/AIHA (2005). *ANSI/AIHA Z10-2005 Occupational Health and Safety Management Systems*. Fairfax, Virginia: American Industrial Hygiene Association.

Buss, W. (2009). *NFPA70E Handbook for Electrical Safety in the Workplace,* Quincy, Massachusetts: Courier/Westford.

CDC (2009). *Worker Deaths in Confined Spaces NIOSH Publication No.94- 1994.* Cincinnati, Ohio: US Department of Health and Human Services.

Code of Federal Regulations 29 Parts 1900 to 1910 (up to section 1000) General Industry Standards (Current Edition). Washington DC: US Government Printing Office.

Hagan, P. (ed) (2001). *Accident Prevention Manual for Business and Industry – Engineering & Technology, 12th Edition.* Chicago, IL: National Safety Council.

Manuel, F, (2008). *Advanced Safety Management; Focusing on Z10 and Serious Injury Prevention.* Hoboken, New Jersey: John Wiley & Sons.

McReynolds, R. (2000). *Step By Step Guide Book On Home Wiring.* Salt Lake City, Utah: Step-By-Step Guide Book Co.

NFPA (2009). *NFPA 70E: Standard for Electrical Safety in the Workplace, 2009 Edition.* Quincy, Massachusetts: Courier/Westford.

OSHA (2002). *Scaffold Use in the Construction Industry: OSHA 3150. Small Business Safety Management Series.* Washington, DC: US Department of Labor.

Historical Bibliography

Alerich, W. & Keljik, J. (1996). *Electricity: AC/DC Motors, Controls and Maintenance, Sixth Edition.* Albany, NY: Delmar Publishers.

Alerich, W. & Keljik, J. (1996). *Electricity: Power Generation and Delivery, Sixth Edition.* Albany, NY: Delmar Publishers.

Balchin, N. & Castner, H. (1993). *Health and Safety in Welding and Allied Processes, Fourth Edition.* New York, NY: McGraw-Hill.

Grimaldi, J. & Simmons, R. (1989). *Safety Management.* Boston, MA: Irwin.

Hammer, W. (1989). *Occupational Safety Management & Engineering.* Englewood Cliffs, CA: Prentice-Hall.

Herman S. (1999). *Delmar's Standard Textbook of Electricity, Second Edition.* Albany, NY: Delmar Publishers.

Kubala, T. (1996). *Electricity: Devices, Circuits and Materials, Volumes 1 & 2, Sixth Edition.* Albany, NY: Delmar Publishers.

Levitt, R. & Semelson, N. (1993). *Construction Safety Management, Second Edition.* New York, NY: McGraw-Hill.

MacCollum, D. (1993). *Crane Hazards and Their Prevention.* Des Plaines, IL: American Society of Safety Engineers.

Appendix B: Old Syllabus of Record

I. Catalog Description

Course Title: SAFE 211 Principles of Industrial Safety II

Prerequisites: SAFE 101

3 class hours
3 lab hours
4 semester hours

(3c-31-4sh)

Stresses an understanding of the complexity of industrial hazard control by thoroughly examining elements of safety and health enumerated in the Occupational Safety and Health Administration promulgated standards and in various consensus standards. Emphasis is placed on welding and cutting, walking and working surfaces, materials handling and storage, electrical safe work practices, construction safety and personal protective equipment. Application of hazard control strategies is accomplished in laboratory sessions.

II. Course Objectives

Students completing this course will be able to:

a. Identify the sources of safety standards such as consensus standards, and OSHA's interpretations of those standards through computer searches of the Internet and safety related databases.

b. Identify the need for engineering controls of safety hazards, use personal protection equipment where necessary and preparation of programs which address their uses, limitations, maintenance, and inspection.

c. Demonstrate the knowledge of hazards for welding and cutting and their evaluation and control mechanisms, including hot work permitting and permit required confined space standards.

d. Explain the hazards, evaluation, and control mechanisms related to wall and floor openings, stairways, ramps, catwalks, ladders, scaffolds, and other walking and working surfaces.

e. Identify the hazards associated with common material handling equipment such as cranes, hoists, derricks; hazards related to the rigging for such equipment are also identified.

f. State the fundamental principles of electrical safe practices and the use of electrical testing equipment.

g. Identify the control of hazards associated with motorized equipment, trenching, blasting, tunneling, steel erection and power transmission equipment in construction.

h. Describe the control of hazards for specialized machinery used in operations such as robotics, pulp, paper and paperboard mills, textiles, sawmills and logging.

III. Course Outline

A. Occupational Safety and Health Standards (3 hours)

1. Development of Standards
2. Enforcement Methods
3. Computer Search Methods
4. Interpretation of Standards

B. Personal Protective Equipment (3 hours)

1. Identifying Needs
2. Maintenance and Inspection Programs
3. Training Programs
4. 1926.95-.107,1910 Subpart I

C. Electrical Safety (6 hours)

1. Principles of Electricity
2. Elements of Electrical Equipment
3. Choosing Electrical Equipment for Hazardous Locations
4. Lockout/tagout Procedures
5. Electrical Power Transmission
6. Wiring and its Associated Hazards
7. Switches/Ground Fault Circuit Interrupters
8. Electrical Grounding as a Safeguard
9. Electrical Test Equipment

D. Welding and Cutting Operations (3 hours)

1. Safeguarding Compressed Gas Cylinders
2. Types of Welding and their Unique Hazards
3. Hot Work Permit Systems
4. Non-Destructive Testing

E. Permit Required Confined Spaces (PCRS) (5 hours)

1. Regulations Governing Spaces
2. Space Classifications
3. Permitting
4. PRCS Program Elements

J. Materials Handling and Storage (4 hours)

1. Mechanized Systems – Conveyors, Hoists, Cranes, Derricks
2. Chain and Sling Rigging Hazards
3. Manual Systems
4. Maintenance, Inspection, and Training

Midterm Examination (1 hour)

K. Trenching (4 hours)

1. Significance of Exposure
2. Mechanics of Collapse
3. Soil Classifications
4. Safeguarding-Sloping, Shoring, Shielding
5. Regulations Governing Operations

L. Scaffolds and Ladders (4 hours)

1. Types of and Use of Scaffolds
2. Identifying Typical Hazard Exposures
3. Regulations Governing Operations and Hazard Control

M. Fall Protection (4 hours)

1. Significance of Exposure
2. Physics of Falls-The Human Experience
3. Options for Protection
4. Regulations Governing Fall Protection

J. Walking and Working Surfaces (2 hours)

1. Significance of Exposure to Employees and Public
2. Coefficient of Friction
3. Choosing Floor Materials
4. Stairways, Ramps, Catwalks

K. Special Industry Machinery and Processes (3 hours)

1. Introduction to Robotic Safety
2. Saw Mills and Logging
3. Meat Cutting
4. Rubber Making
5. 1910 Subpart R

L. Culminating Activity (2 hours)

Laboratory Exercises (42 hours, each at 3 hours)

The following laboratory exercises are an integral part of the course, giving the students an opportunity to observe and apply many of the fire safety concepts first hand, at appropriate times during the course. Separate grades will be issued for the laboratory exercise, see Evaluation Methods section.

The specific laboratory exercises are described below:

1. Introduction to laboratory equipment, methods of operation, and presentation of data and results. Agreement on what constitutes a "hazard". Review of quantitative and qualitative assessments typically conducted by the safety professional. Conduct basic hazard assessment in the lab and identify control measures in place (Engineering, Administrative and PPE) as well as the consensus standards applicable.

2. Computer identification of standards and interpretation of standards. Exposure to useful safety resources on line and software packages.

3. Hazard Assessment for PPE; Selecting cost effective PPE and convincing management of the need to purchase PPE.

4. Development of a JSA for Welding operations by performing and assessing sample welding. Conduct Non-Destructive testing on weld.

5. Determine the slip hazards by determining coefficients of frictions on walking surfaces; use of slip meter. Compare readings to OSHA and ADA mandates.

6. Crane and hoist sling tension analysis. Use of algebra to calculate sling tension and compare findings to measured tensions. Identify sources of error in tension calculations.

7. Conduct hazard assessment in a Power Generation and Distribution facility. Solidify understanding of Permit Required Confined Spaces.

8. Wire simple receptacles on "breadboard" and identify errors in wiring using test instruments Become familiar with both 3-wire and double-insulated tool testing equipment and use each in testing equipment, (2 Labs).

9. Determine which equipment in the Safety Lab must be locked out or tagged out by standards and describe the devices to do such. Prepare a lockout/tagout procedure for one hard wired piece of equipment in the laboratory. .

10. Use of 1/3 scale tubular scaffold. Identify elements of a scaffold. Prepare a ladder and scaffold inspection checklist for the equipment available.

11. Become familiar with the soil testing equipment and perform tests, determine the sloping required for a given trench condition. Conduct an OSHA hazard assessment of an actual trench and/or determine safeguards for OSHA published *"Fatal Facts."*

12. Become familiar with a number of fall protection devices as used on a series of elevations and working surfaces; determine their advantages and/or shortcomings.

13. Conduct an OSHA hazard assessment of a construction fall exposure and/or determine safeguards for OSHA published *"Fatal Facts."*

IV. Evaluation Methods

The faculty person assigned to teach this course could be one of several faculty within the Safety Sciences Department. What follows is an example of the evaluation methods and weighting used by one of those faculty:

Classroom Evaluation

Weighting:

Midterm exam	20%
Final	20%
Group Project	20%
Quizzes/Tests	25%
Assignments	10%
Participation*	5%

*This includes but is not limited to: individual participation in whole class and small group discussions and other brief class presentations

No make-up examinations will be given except in the case of illness (confirmed in writing by the infirmary or MD) or a documented (in writing) family emergency. Regardless of reason, absolutely no make-up exams will be given unless the instructor is contacted prior to the scheduled test period.

Laboratory Evaluation

Students receive a separate grade for the laboratory exercises and final grade in the laboratory portion of this course will be determined from and will be weighted as described below:

A. Quizzes (10%)
   Quizzes may be open book and unannounced. They may be made up of short answer, true/ false, or multiple choice questions.

B. Participation (5%)
   Students must attend the entire lab period in order to receive full credit.

C. Laboratory Reports (75%)
   Laboratory reports will be prepared for most sessions and will follow a specific format as provided in the SAFE 211 LAB REPORT GUIDELINES. Report grades will be based on accuracy, completeness and originality.

D. Portfolio (10%)
   A minimum of three (3) improved versions of laboratory activities must be presented in a portfolio suitable for a job interview. These pieces should demonstrate 1) ability to work with others,
   2) ability to identify, evaluate and control hazards, and
   3) computer skills.

Grading Scale:

A=90-100%
B=80-89%
C=70-79%
D=60-69%
F= <60%

Grading will be based on the portfolio's professional appearance, organization, timeliness, evidence of the above three items, evidence of improved work, and a reflective statement. At the discretion of the instructor, a grading curve that results in an appropriate distribution of grades may be used in place of the scale described above.

V. Attendance Policy

Although there is no formal attendance policy for this class, student learning is enhanced by regular attendance and participation in class discussions and the university expects all students to attend class.

VI. Required Text

Laing, Patricia M., Editor. (2001). Accident Prevention Manual for Business and Industry – Engineering & Technology, 12th Edition. Chicago, IL: National Safety Council.

Code of Federal Regulations 29 Parts 1900 to 1910 (up to section 1000) General Industry Standards. (Current Edition). Washington, DC: US Government Printing Office.

VII. Special Resource Requirements

None

VIII. Bibliography

Alerich, W. & Keljik, J. (1996). *Electricity: AC/DC Motors, Controls and Maintenance, Sixth Edition.* Albany, NY: Delmar Publishers.

Alerich, W. & Keljik, J. (1996). *Electricity: Power Generation and Delivery, Sixth Edition.* Albany, NY: Delmar Publishers.

Code of Federal Regulations 29 Parts 1900 to 1910 (up to section 1000) General Industry Standards. (Current Edition). Washington DC: US Government Printing Office.

Herman S. (1999). *Delmar's Standard Textbook of Electricity, Second Edition.* Albany, NY: Delmar Publishers.

Kubala, T. (1996). *Electricity: Devices, Circuits and Materials, Volumes 1 & 2, Sixth Edition.* Albany, NY: Delmar Publishers.

Laing, P., Editor. (2000). *Accident Prevention Manual for Business and Industry – Engineering & Technology, 12th Edition.* Chicago, IL: National Safety Council.

Historical Bibliography

Balchin, N. & Castner, H. (1993). *Health and Safety in Welding and Allied Processes, Fourth Edition.* New York, NY: McGraw-Hill.

Grimaldi, J. & Simmons, R. (1989). *Safety Management.* Boston, MA: Irwin.

Hammer, W. (1989). *Occupational Safety Management & Engineering.* Englewood Cliffs, CA: Prentice-Hall.

Levitt, R. & Semelson, N. (1993). *Construction Safety Management, Second Edition.* New York, NY: McGraw-Hill.

MacCollum, D. (1993). *Crane Hazards and Their Prevention.* Des Plaines, IL: American Society of Safety Engineers.

Appendix C: Proposed Revised Catalog Description

SAFE 211 Principles of Safety II – Construction Industry **2c-31-3cr**
Prerequisite: SAFE 101

Develops an understanding of hazard recognition, evaluation, prioritization and control of critical workplace hazards associated with construction. Students are exposed to the complexity of three dimensional work which exists in the fast paced construction industry by thoroughly examining elements of safety and health enumerated in the Occupational Safety and Health Administration standards and in various consensus standards. Emphasis is placed on personal protective equipment, electrical safety, scaffolds, fall protection, trenches and confined space entry including rescue. Practical application of associated hazards and their control strategies is accomplished in laboratory sessions.