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Submission Date: \_\_\_\_\_  
Action-Date: \_\_\_\_\_



UWUCC USE Only  
Number: 96-56d  
Submission Date: App 4/15/97  
Action-Date: Senate App 4/29/97

**CURRICULUM PROPOSAL COVER SHEET**  
University-Wide Undergraduate Curriculum Committee

**I. CONTACT**

Contact Person Mr. Richard Christensen Phone 3017  
Department Safety Sciences

**II. PROPOSAL TYPE (Check All Appropriate Lines)**

**COURSE** Prin Ind Safety II  
Suggested 20 character title  
 **New Course\*** \_\_\_\_\_  
Course Number and Full Title  
 **Course Revision** SA 211 Principles of Industrial Safety II  
Course Number and Full Title  
 **Liberal Studies Approval+** \_\_\_\_\_  
for new or existing course Course Number and Full Title  
 **Course Deletion** \_\_\_\_\_  
Course Number and Full Title  
 **Number and/or Title Change** \_\_\_\_\_  
Old Number and/or Full Old Title  
\_\_\_\_\_  
New Number and/or Full New Title

**Course or Catalog Description Change** SA 211 Principles of Industrial Safety  
Course Number and Full Title

**PROGRAM:**  Major  Minor  Track  
 **New Program\*** \_\_\_\_\_  
Program Name  
 **Program Revision\*** \_\_\_\_\_  
Program Name  
 **Program Deletion\*** \_\_\_\_\_  
Program Name  
 **Title Change** \_\_\_\_\_  
Old Program Name  
\_\_\_\_\_  
New Program Name

**III. Approvals (signatures and date)**

Lon H. Ferguson 3/17/96  
Department Curriculum Committee

Mary E. Sweeney 11/11/96  
College Curriculum Committee

+ Director of Liberal Studies (where applicable)

Robert Zube 11 Nov 96  
Department Chair 12 FEB 96

Charles J. Zoni 11/10/96  
College Dean

\*Provost (where applicable)

\*no new resources required

Attachment D

SA 211 Principles of Industrial Safety II

## Catalog Description

SA 211 Principles of Industrial Safety II

(3c-31-4sh)

Prerequisites: SA111

Stresses understanding the complexity of the industrial hazard control problem by thoroughly examining elements of safety and health enumerated in the OSHA-promulgated standards. Emphasis is placed on personal protective equipment, welding and cutting, walking and working surfaces, material handling, electrical safe work practices, and construction safety.

# SYLLABUS OF RECORD

## I. Catalog Description

Course Title: SA211 Principles of Industrial Safety II

Prerequisites: SA111

4 credits

3 lecture hours

3 lab hours

(3c-3l-4sh)

Stresses understanding the complexity of the industrial hazard control problem by thoroughly examining elements of safety and health enumerated in the OSHA-promulgated standards. Emphasis is placed on personal protective equipment, welding and cutting, walking and working surfaces, material handling, electrical safe work practices, and construction safety.

## II. Course Objectives

Students completing this course will be able to:

- A. Identify the sources of safety standards such as OSHA and interpretations of those standards through the use of a computer database.
- B. Identify the need for programs to include personal protective equipment, its use, maintenance, and inspection.
- C. Demonstrate the knowledge of hazards for welding and cutting and their evaluation and control mechanisms.
- D. Define the selection methods for, hazards and controls for the safe use of hand and power tools.
- E. Explain the hazards of, evaluation for, and control mechanisms related to wall and floor openings, stairways, ramps, catwalks, ladders, scaffolds, and other walking and working surfaces.
- F. 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.
- G. State the fundamental principles of electrical safe practices and the use of electrical testing equipment.

- H. Identify the control of hazards associated with motorized equipment, trenching, blasting, tunneling, steel erection and power transmission equipment in the construction business.
- I. Describe the control of hazards for specialized machinery used in the operation of bakeries, laundries, rubber processing, textiles, agriculture, and others.

### III. Course Outline

- A. Occupational Safety and Health Standards (3 Hours)
  - 1. Development of standards
  - 2. Enforcement methods
  - 3. Computer search methods
  - 4. Interpretations of standards
- B. Personal Protective Equipment (4 Hours)
  - 1. Identifying needs
  - 2. Maintenance and Inspection programs
  - 3. Training programs
- C. Welding and Cutting Operations (5 Hours)
  - 1. Gas welding hazards
  - 2. Arc welding hazards
  - 3. Resistance welding hazards
  - 4. Compressed gas cylinders
  - 5. Hot work permit systems
- D. Hand and Power Tools (5 Hours)
  - 1. Metal cutting tools
  - 2. Torsion tools
  - 3. Miscellaneous tools
  - 4. Centralized tool control
  - 5. Maintenance and inspection
  - 6. Powder actuated tools
- E. Walking and Working Surfaces (4 Hours)
  - 1. Floor and wall openings
  - 2. Stairways, ramps, catwalks
  - 3. Design and use of ladders and scaffolds
- F. Materials Handling and Storage (5 Hours)
  - 1. Mechanized systems - conveyors, hoists, cranes, derricks
  - 2. Chain and sling rigging hazards
  - 3. Manual systems
  - 4. Maintenance, inspection, and training

- G. Electrical Safety (6 Hours)
  - 1. Principles of electricity
  - 2. Principles of electrical equipment
  - 3. Electrical grounding as a safeguard
  - 4. Electrical test equipment
  - 5. Lockout/tagout procedures
  - 6. Static electricity and its control
  
- H. Construction Safety (8 Hours)
  - 1. Motorized equipment hazards
  - 2. Trenching
  - 3. Blasting
  - 4. Tunneling
  - 5. Steel erection
  - 6. Electrical power transmission
  
- I. Special Industry Machinery and Processes (2 Hours)
  - 1. Special hazards of specialized equipment
  
- J. Laboratory Exercises (42 Hours)

Exercises will be performed in a laboratory setting and are described below. A summary showing where these exercises fit into the course outline follows that description.

Introduction to laboratory equipment, methods of operation, and presentation of data and results.

Computer identification of standards and interpretations of standards

Needs assessment for Personal Protective Equipment (PPE); develop requirements for Safety Lab, including welding

Inspection of gas and electric welding operation; development of Hot Work Permit procedure

Determine the slip hazards by determining frictions on walking surfaces; use of slipometer

Crane and hoist sling tension and stress analysis; Develop a crane and hoist inspection checklist for the crane and hoist in the Safety Lab and perform an inspection of each.

Determine electrical items to be tested using a number of test instruments and perform inspection using those instruments. Become familiar with both 3-wire and double-insulated tool testing equipment and use each in testing equipment. Determine what

equipment in the Safety Lab must be locked out or tagged out and describe the devices to do such; prepare a lockout/tagout procedure for the lab.

Prepare a ladder and scaffold inspection checklist for the equipment available and develop an inspection procedure for both. Become familiar with the soil testing equipment and perform a test on a series of samples; determine the sloping required for a given trench conditions. 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, and develop a fall protection plan.

Prepare a Job Safety Analysis (JSA) for a number of tasks described on the equipment in the lab.

**Summary:**

Title of Lab Equipment	# of Hours	Lecture Units Covered in Course Outline
Introduction - Lab Equipment	3	---
Computer Standards I,D.	3	A
PPE Assessment	3	B
Gas/Electric Welding	3	C
Slip Hazards	3	E
Cranes/Hoist Analyses	6	F
Electrical Safety	9	G
Construction Safety	9	H
JSA Development	3	C,D,F,G,I

**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:

- A. At least two examinations (50%)  
 All examinations will be announced and will be closed book except for the use of the Code of Federal Regulations (29CFR1900 thru 1910) during certain sections of the exam. Questions on exams may be short answer, multiple choice, true/false, or matching. The final exam will be comprehensive, covering the total semester.

**B. Quizzes (10%)**

Quizzes will be similar in format to the examinations; however, they may not be announced. Quizzes will emphasize readings from the texts, CFR's, handouts, and current notes.

**C. Homework (15%)**

Homework may include the following:

1. Industrial scenarios which require the use of OSHA, ANSI, etc. standards to identify hazards and possible control strategies.
2. Written chapter summaries from the text.
3. Individual and group projects involving case studies of industrial exposures.
4. Other problems requiring the use of material covered.

**D. Laboratory Exercises (25%)**

Laboratory exercises are a regular requirement of this course. Students will complete a number of exercises which will entail the preparation of a formal technical report.

The following grading scale will be used to assign letter grades, related to the evaluation of student performance based on a percentage scale:

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

**V. Required Texts**

Laing, Patricia, M. Editor. Accident Prevention Manual for Business and Industry-Engineering & Technology. 11th Edition. Chicago: National Safety Council, 1996.

Code of Federal Regulations 29 Parts 1900 to 1910 (up to section 1000) General Industry Standards. 1995 edition. Washington, D.C.: U.S. Government Printing Office, 1995.

**VI. Special Resource Requirements**

None

**VII. Bibliography**

Balchin, Nigel C. And Castner, Harvey R. Health and Safety in Welding and Allied Processes. Fourth Edition. New York: McGraw-Hill, Inc., 1993.

Grimaldi, J. And Simonds, R. Safety Management. Boston, MA.: Irwin, 1989.

Hammer, Willie. Occupational Safety Management & Engineering. Englewood Cliffs, NJ.: Prentice-Hall, 1989.



Levitt, Raymond and Semelson, Nancy. Construction Safety Management. Second Edition. New York: McGraw-Hill, 1993.

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

Laing, Patricia, M. Editor. Accident Prevention Manual for Business & Industry-Administration and Programs. 11 Edition. Chicago: National Safety Council, 1996.

## Course Revision: SA 211 Principles of Industrial Safety II

### Part II. Description of the Curriculum Change

1. The new syllabus of record for this course is attached.
2. What follows is a summary of the proposed changes to SA 211:
  - A. The course description was changed slightly to include new content proposed for the revised course, content transferred from another course, and to delete previous content to be covered in other courses.
  - B. A 3 hour laboratory has been added to the class.
  - C. The course objectives have been expanded from 3 to 9. The original three (3) objectives have been deleted as they were too broad and not behaviorally oriented. The nine (9) objectives that were added are behavioral objectives which were added to best reflect the detailed content of the course as it was being taught.
  - D. The unit for "walking and working surfaces" was added. It was previously covered in SA111. This adjustment will accommodate a portion of a laboratory exercise planned for SA211.
  - E. The unit for "materials handling and storage" was added. It was previously covered in SA 111. A portion of the unit covering industrial trucks and automatic guided vehicles was left in SA 111. It was believed that coverage of cranes, slings, and other types of material handling equipment would better fit into SA 211 where a laboratory exercise could be planned for them.
  - F. The unit on "industrial sanitation" was transferred to SA111 to make room for other content requiring the availability of laboratory exercises.
  - G. The units on "confined space operation" and "chemical safety" are covered in SA 311 Industrial Fire Protection and SA 301 Health Hazard Identification.
  - H. SA111 is now a prerequisite course and therefore SA 101 and 102 are no longer necessary.
3. In general, these revisions were necessary to update the coverage of new material. This additional material was necessary to better meet the needs of our students in their role as safety and health professionals as well as the requirements of our accrediting agency. Some units from SA 111 were transferred here because it was believed this material could be better presented in the same class using the proposed SA 211 laboratory exercises.
4. The old syllabus of record is attached.
5. These course changes will not affect the Liberal Studies requirements.

### Part III. Letters of Support

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

## SYLLABUS OF RECORD

### I. Catalog Description

~~SA 211 Principles of Industrial Safety~~ 3c-01-3sh  
Prerequisite: SA 101 or SA 102, CH 101

Stresses understanding the complexity of the industrial hazard control problem by thoroughly examining elements of safety and health enumerated in the OSHA-promulgated standards. Emphasis on welding and cutting operations, electrical safety, chemical safety, personal protective equipment, industrial sanitation, and construction safety.

### II. Course Objective

- A. To assure the students' understanding of the principles of industrial safety.
- B. To enable the students to apply these principles.
- C. To interpret and apply OSHA standards to business and industry.

### III. Course Outline

- A. Welding and Cutting Operations (5 hours)
- B. Confined Space Operations (3 hours)
- C. Electrical Safety (6 hours)
- D. Hand and Power Tools (5 hours)
- E. Chemical Safety (4 hours)
- F. Personal Protective Equipment (5 hours)
- G. Construction Safety (10 hours)
- H. Industrial Sanitation (2 hours)
- I. Special Industry Machinery and Processes (2 hours)

### IV. Evaluation Methods

The final grade will be determined by using any combination of at least four(4) of the following evaluation methods within the range of weights shown as determined by the individual faculty member and which must total 100%.

0-60% Exams

There will be a minimum of two written exams consisting of combinations of multiple choice,

true/false, matching, completion, and essay questions; or other interactive exams. Make-up exams are at the discretion of the individual faculty member.

**0-25% Quizzes**

Periodic quizzes will be given. Some individual faculty members may utilize unannounced quizzes. Make-up quizzes are at the discretion of the individual faculty member.

**0-15% Homework**

Periodic out-of-classroom assignments will be given.

**0-40% Term Papers/  
Projects**

Each student will prepare formal papers or projects on a topic approved by the individual faculty member.

**0-20% In-Class Writing**

Each student will prepare various assignments in class utilizing free-style writing techniques as scheduled by the individual faculty member.

**0-25% Presentations**

Each student will participate in an oral presentation topic approved by the individual faculty member.

**0-20% Participation**

Each student will provide active engagement in the classroom.

**0-25% Group Activity**

Students will be assigned various activities requiring a collaborative effort with other students.

Extra credit can be assigned to any one of the above evaluation methods at the discretion of the instructor.

The grading scale will be based on the following:

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

or, at the discretion of the faculty member a grading curve that results in a normal distribution of grades.

**V. Required Textbooks, Supplemental books and Readings**

**Textbook: Accident Prevention Manual for Business and Industry Vol. #2 (Engineering & Technology), Tenth**

Edition, National Safety Council, Chicago, 1992.

Textbook: Code of Federal Regulations 29-Parts 1901.1 to 1910.999 (Volume 1), U.S. Government Printing Office, Washington: Latest Revision

Textbook: Code of Federal Regulations 29-Parts 1926, U.S. Government Printing Office, Washington: Latest Revision

#### VI. Special Resources Required

None

#### VII. Bibliography

Asfahl, Ray C. Industrial Safety & Health Management 2nd Edition, Prentice-Hall Inc., Englewood Cliffs, NJ 1990.

Colling, David A. Industrial Safety Management & Technology, Prentice Hall Inc., Englewood Cliffs, NJ 1990.

Hammer, Willie, Occupational Safety Management and 4th Engineering 4th Edition, Prentice-Hall, Inc., Englewood Cliffs, NJ 1989

Levitt, Raymond & Semelson, Nancy. Construction Safety Management McGraw-Hill, New York, NY 1987

National Safety Council, Accident Prevention Manual for Business & Industry Vol. #1 (Administration & Programs), 10th Edition, National Safety Council, Chicago.