

LSC Use Only Proposal No:
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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) Mr. Pat Yorio	Email Address pyorio@iup.edu
Proposing Department/Unit Safety Sciences	Phone 7-3270

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

Current course prefix, number and full title: SAFE 220 Hazardous Materials

Proposed course prefix, number and full title, if changing: SAFE 220 Hazardous Materials and Emergency Management

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 <i>Jan K Wachter</i>	9-13-2011
Department Chairperson(s)	Dr. Lon Ferguson <i>Lon W. Ferguson</i>	9-15-2011
College Curriculum Committee Chair	Dr. Jan K. Wachter <i>Jan K Wachter</i>	10-20-2011
College Dean	Dr. Mary Swinker <i>Mary E Swinker</i>	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	<i>Gail Schust</i>	12/13/11

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Liberal Studies

Liberal Studies

Course Revision: SAFE 220 Hazardous Materials

Part II. Description of Curricular 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 title and description were changed to reflect additional coverage of emergency management topics.
- b. Course content topic hours were adjusted to reflect additional coverage of emergency management topics. Course content was also changed to reduce redundancy of course content with information being covered in other SAFE courses.
- c. Course objectives were changed to better track ABET accreditation criteria for student outcomes.

New Course Description (changes in bold)

SAFE 220 Hazardous Materials and Emergency Management	3 class hours
	0 lab hours
Prerequisite: CHEM 101, SAFE 101 or instructor permission	3 credits (3c-01-3cr)

Provides a basic understanding of the storage, transportation and use of hazardous materials in business. Includes a discussion on hazardous materials, specifically their definitions, categories, **properties**, regulations, and evaluation. **Critical principles of emergency management, including both private and public sector elements, are included.**

Old Course Description

SAFE 220 Hazardous Materials	3 class hours
	0 lab hours
Prerequisites: CHEM 101, SAFE 101 or instructor permission	3 credits (3c-01-3cr)

Provides a basic understanding of the storage, transportation and use of hazardous materials in business. Includes a discussion on hazardous materials, specifically their definitions, categories, regulations, and evaluation. Emergency response planning is also covered.

3. Justification/rationale for the revision.

As part of the effort to increase our program's emphasis on principles of environmental and health considerations within the field of safety sciences, the department of safety sciences has introduced a few new courses. These courses cover some of the elements that were traditionally included within the scope of SAFE 220. In order to ensure that the students do not receive redundant instruction, a revision of SAFE 220 with consideration of the content of

the new courses has been developed. This scope of the current revision ensures that the discussion of hazardous materials focuses on the key management system considerations business must incorporate when they deal with hazardous materials. In addition, emergency management topics have become increasingly important to the safety field; thus, the course content was revised to reflect this emphasis.

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

This course is required for all SAFE majors and minors and does not affect other departments. Therefore, letters of support from other programs was not requested.

Appendix A: New Syllabus of Record

I. Catalog Description

SAFE 220 Hazardous Materials and Emergency Management	3 class hours
	0 lab hours
Prerequisite: CHEM 101, SAFE 101 or instructor permission	3 credits
	(3c-01-3cr)

Provides a basic understanding of the storage, transportation and use of hazardous materials in business. Includes a discussion on hazardous materials, specifically their definitions, categories, properties, regulations, and evaluation. Critical principles of emergency management, including both private and public sector elements, are included.

II. Course Objectives

Students will be able to:

- A. Demonstrate an understanding of the fundamental aspects of hazardous materials.
- B. Demonstrate an understanding of hazardous materials/waste recognition, control and remediation.
- C. Recite various definitions and terminology used to categorize and define properties of hazardous materials.
- D. Understand the elements of a comprehensive management system needed to remediate or control the hazards associated with the use of hazardous materials.
- E. Select the various federal regulations related to the use, storage and transportation of hazardous materials with an emphasis on the Occupational Safety and Health Administration and the Department of Transportation requirements.
- F. Understand the importance and elements of an emergency management program as an essential component of the comprehensive hazardous materials safety management system.
- G. Understand the federal, state, and local regulations that address emergency preparation and planning for businesses that deal with hazardous materials.
- H. Develop competencies in hazardous materials emergency response including the ability to identify, evaluate and define emergency response plans and appropriate levels of personal protection.

III. Course Outline

- A. Introduction and Overview** **5 hours**
- a. What is a hazardous material?
 - b. Where are hazardous materials used in manufacturing processes and in other commercial applications?
 - c. Examples of hazardous materials accidents and an overview of the hazards that one must consider when dealing with hazardous materials.
 - d. Brief overview of the rules and regulations that will be used to help guide our thinking about hazardous materials including the DOT, OSHA, and the EPA.
- B. Chemical Management Systems** **6 hours**
- a. Presentation of relevant definitions and terminologies used in discussions of hazardous materials.
 - b. Review of key elements addressed in a hazardous materials management system. The United States Department of Energy Hazardous Materials Handbook is used as a guide to facilitate this discussion.
- C. Hazard Communications and the Properties of Hazardous Materials** **12 hours**
- a. Requirements of the OSHA hazard communications standard.
 - b. Safety data sheets (SDS) overview.
 - c. A detailed look into the sections of an ANSI formatted SDS with an emphasis on what types of information is contained in each section and how this information can be used by the safety professional.
 - d. Conversion of gallons of a chemical to pounds and vice versa which is particularly relevant to understanding coverage under OSHA's process safety management regulations.
 - e. Student projects: students are required to conduct research on a specific chemical with a focus on one specific assigned section of the ANSI SDS for that chemical. Students must emphasize what information is contained in the SDS and how it can be used in the identification, evaluation, and control process.
- D. Midterm** **2 Hours**
- E. Process Safety Management** **5 Hours**
- a. History, overview and purpose: Bhopal incident; rule development; continued hazardous chemical incidents; national emphasis programs.
 - b. Coverage of the rule: Appendix A and review of computations to determine coverage.

- c. Review of all elements within the scope of the standard, for example: process safety information; operating procedures; training; hazard analysis; incident investigation; management of change; hot work; etc.

F. Transportation of Hazardous Materials 5 Hours

- a. Coverage of the Department of Transportation's (DOT) Hazardous Materials Regulations (HMR).

G. Hazardous Materials Emergency Management 7 Hours

- a. Overview of the applicable rules and regulations: DOT, EPA, OSHA.
- b. DOT: discussion of the emergency response guidebook; how it is used by first responders.
- c. OSHA: the requirements of the hazardous waste operations and emergency response regulation.

H. Final (2 hours during final examination period)

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 for this course:

Your final grade in this class will be a compilation of the following:

A. Examinations	50%
B. Quizzes	30%
C. Homework/Projects	20%

Examinations and Quizzes: The examinations and quizzes will be short answer, multiple choice, true/false and matching with material coming from lecture notes, the text and handouts.

Homework/Projects: Homework and projects will be assigned based on the material covered in the specific unit, many of which are case studies and small group projects involving the recognition, evaluation and control of hazardous materials.

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

V. Example Grading Scale

In general, the following scale will be used in assigning letter grades, related to the evaluation of student performance based on a “percentage” grading scale:

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

VI. Attendance Policy

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

VII. Required Textbooks

Hazardous Materials Handbook: Awareness and Operations Levels (1st edition). (2008).
Delmar Publishing, Cengage Learning.

VIII. Special Resource Requirements

None.

IX. Bibliography

Chemical Management Handbook-1139 (2008). Washington, DC: United States Department of Energy.

National Safety Council. (2002). *7 Elements of a Successful Environmental Program*. Itasca, IL: National Safety Council.

Pichtel, J. (2000). *Fundamentals of Site Remediation*. Rockville, MD: Government Institutes.

Spellman, F., Drinan, J. & Whiting, N. (2001). *Transportation of Hazardous Materials – A Practical Guide to Compliance*. Rockville, MD: Government Institutes.

Sullivan, T. (Ed.) (2003). *Environmental Law Handbook, 17th Edition*. Rockville, MD: Government Institutes.

Voyles, J. (2002). *Managing Your Hazardous Wastes, 2nd edition*. Rockville, MD: Government Institutes.

Historical References

Hallenbeck, W.H. (1993). *Quantitative Risk Assessment for Environmental and Occupational Health, 2nd edition*. Boca Raton, FL: CRC Press.

Harrison, L. (1995). *Environmental, Health, and Safety Auditing Handbook, 2nd edition*. New York, NY: McGraw-Hill.

Howard, P.H. & Neal, M. (1992). *Dictionary of Chemical Names and Synonyms*. Boca Raton, FL: Lewis Publishers.

Appendix B: Old Syllabus of Record

I. Catalog Description

SAFE 220 Hazardous Materials	3 class hours 0 lab hours 3 credits (3c-01-3cr)
Prerequisites: SAFE 101	

Provide the student a basic understanding of the storage, transportation and use of hazardous materials in business. This will include a discussion on hazardous materials, specifically the definitions, categories, regulations and evaluation of hazardous materials. Emergency response planning will also be covered in this class.

II. Course Objectives

The students will be able to:

- a. discuss the basic concept of ecosystems and the interaction between organisms and the environment.
- b. utilize federal regulations related to hazardous materials to assess compliance
- c. apply chemical spill risk assessment and identify appropriate hazard control techniques
- d. identify an example of a hazardous material for each of the nine classes of Hazardous Materials as defined by the Department of Transportation (DOT).
- e. demonstrate competency in using the National Fire Protection Association (NFPA) Fire Protection Guide on Hazardous Materials and the DOT North American Emergency Response Guidebook.
- f. evaluate risk from disasters and develop appropriate disaster response plans
- g. communicate effectively.

III. Course Outline

- A. Introduction: Background (5 hours)
1. Historical perspective on hazardous materials
 2. Interrelationships of matter, energy and environment
 3. Overview of environmental and hazardous materials regulations

B. Principles of Hazardous Materials (6 hours)

1. Fate and transport characterization
2. Ecosystems and communities
3. Bio Hazards

C. Properties of Hazardous Materials (12 hours)

1. Categories of hazardous materials properties
2. Federal regulations
3. Hazardous materials definitions
4. Human Toxicology
5. Determination of properties of hazardous materials

Midterm (1 hour)

D. Transportation of Hazardous Materials (9 hours)

1. DOT Regulations
2. Labeling of Hazardous Materials
3. Placarding of Hazardous Materials

E. Emergency Preparedness (9 hours)

1. Assessment of risk
2. Planning considerations
3. Developing an Emergency Plan
4. Evaluation of plan
5. Resources for emergency preparedness

Final Examination (2 hours)

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 for this course:

Your final grade in this class will be a compilation of the following:

D. Examinations	30%
E. Quizzes	30%
F. Homework/Projects	35%
G. Class Participation	5%

Examinations and Quizzes: The examinations and quizzes will be short answer, multiple choice, true/false and matching with material coming from lecture notes, the text and handouts.

Homework/Projects: Homework and projects will be assigned based on the material covered in the specific unit, many of which are case studies and small group projects involving the recognition, evaluation and control of hazardous materials.

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

V. Example Grading Scale

In general, the following scale will be used in assigning letter grades, related to the evaluation of student performance based on a “percentage” grading scale:

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

VI. Attendance Policy

The attendance policy for this course conforms to the University’s Undergraduate Course Attendance Policy; in that all students are expected to attend and participate in class to enhance their learning.

VII. Required Textbooks

National Safety Council. (2002). Accident Prevention Manual: Environmental Management, National Safety Council, Itasca, IL, 2nd edition.

Stringfield, W. (2000). Emergency Planning and Management, Government Institutes, Rockville, MD, 2nd edition.

VIII. Special Resource Requirements

None.

VII. Bibliography

Bodger, K. (2003). Fundamentals of Environmental Sampling, Government Institutes, Rockville, MD.

Hart, J. & McKiel, M. (2002). ISO 14000: Questions and Answers. National Safety Council, Itasca, IL, 6th edition.

National Safety Council. (2002). 7 Elements of a Successful Environmental Program. National Safety Council, Itasca, IL.

Owen, O. and Chiras, D. (2002). Natural Resource Conservation, An Ecological Approach, Macmillan Publishing Company, 8th edition.

Pichtel, J. (2000). Fundamentals of Site Remediation. Government Institutes, Rockville, MD.

Spellman, F., Drinan, J. and Whiting, N. (2001). Transportaion of Hazardous Materials – A Practical Guide to Compliance. Government Institutes, Rockville, MD.

Spellman, F. and Whiting, N. (1999). Environmental Science and Technology – Concepts and Applications. Government Institutes, Rockville, MD.

Sullivan, T, Editor. (2003). Environmental Law Handbook, Government Institutes, Rockville, MD. 17th edition.

Voyles, James. (2002). Managing Your Hazardous Wastes, Government Institutes, Rockville, MD. 2nd edition.

Historical

Hallenbeck, W.H. (1993). Quantitative Risk Assessment for Environmental and Occupational Health, 2nd edition. Boca Raton, FL: CRC Press.

Harrison, L. (1995). Environmental, Health, and Safety Auditing Handbook, 2nd edition. New York: McGraw-Hill.

Howard, P.H. and Neal, M. (1992). Dictionary of Chemical Names and Synonyms. Boca Raton, FL: Lewis Publishers.

Appendix C: Proposed Revised Catalog Description

SAFE 220 Hazardous Materials and Emergency Management

3c-01-3cr

Prerequisite: CHEM 101, SAFE 101 or instructor permission

Provides a basic understanding of the storage, transportation and use of hazardous materials in business. Includes a discussion on hazardous materials, specifically their definitions, categories, properties, regulations, and evaluation. Critical principles of emergency management, including both private and public sector elements, are included.