



Occupational Safety, Health, and Environment (OSH&E) Program  
Department of Computer Science and Industrial Technology  
Southeastern Louisiana University  
SLU 10847  
Hammond, LA 70402

November 17, 2008

Dear OSH&E Industrial Advisory Committee Member,

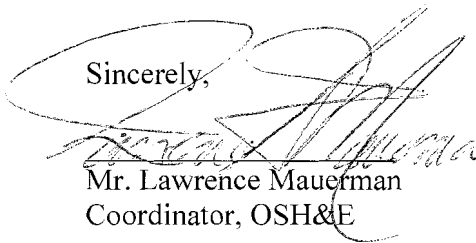
On behalf of Southeastern Occupational Safety, Health, and Environment (OSH&E) Program, we would like to give our sincere appreciation for your involvement in the OSH&E Industrial Advisory Committee as well as your participation in the meetings and discussion.

Enclosed please find the report of the OSH&E Industrial Advisory Committee meeting that was held on October 17, 2008. Please feel free to let us know your questions and comments!

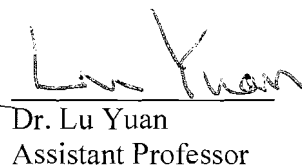
It is our great honor and pleasure to invite you for our next quarterly meeting, which is tentatively scheduled from 11:30 AM to 2:00 PM on **January 23, 2009** at **Southeastern School of Nursing in Baton Rouge**. A formal letter will be sent to you when the meeting date and venue are determined.

Thank you very much for your consistent contribution to the program!

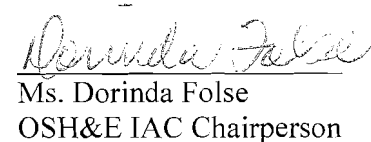
Sincerely,



Mr. Lawrence Mauefman  
Coordinator, OSH&E



Dr. Lu Yuan  
Assistant Professor



Ms. Dorinda Folse  
OSH&E IAC Chairperson

**OSH&E Program**  
**Industrial Advisory Committee**  
**October 17, 2008 Meeting Report by Dr. Lu Yuan**

The last Occupational Safety, Health, and Environment (OSH&E) Industrial Advisory Committee (IAC) meeting was held from 9:30 AM to 1:00 PM on October 17, 2008 at Southeastern University Center in Hammond. (Please see the attached example photos!) This meeting was part of the Annual Department Industrial Advisory Committee Meeting. The attendees include nine of the fourteen OSH&E IAC members (Appendix A with updated information). Mr. Lawrence Mauerman, Drs. Ephraim Massawe and Lu Yuan, the three full-time faculty members of the OSH&E program, were the co-hosts of the meeting. Two OSH&E student members, Jeremy Spears and Mary Faust, were present as well. Absent were Richard Matherne, Don Jones, Wayne LaCombe, Beth Inbau, and Lance Roux.

Appendix B lists the agenda of the overall meeting, which started with the welcoming speech from Dr. Dan McCarthy, Dean of College of Science & Technology. Then Mr. George Fairbanks, the Department Advisory Committee Chairperson, addressed the group and highlighted faculty and students working together, faculty getting involved with students' activities and encouraging students to become involved in research projects.

Next, Dr. Cris Koutsougeras, Department Head, reported the departmental progress. He stated that a new program, Engineering Technology (ET), has been established and approved by the Louisiana Board of Regents. He encouraged the Advisory Committee members to provide input on the new program, as well as recommendation on the existing program accreditation process.

Dr. Pete Territo reported that ABET is coming to review the Computer Science program. He explained that Computer Science and Industrial Technology were merged in the past, but that the name of the program was not adjusted to reflect the change in the Industrial Advisory Committee by-law. Mr. Fairbanks initiated a vote to change the name to Department of Computer Science and Industrial Technology in the by-law. A vote was taken and passed.

*At that time the committee broke out into groups by degrees.*

The agenda for the OSH&E IAC meeting is attached in Appendix C. Mr. Lawrence Mauerman greeted committee members and introductions were followed.

The first item on the agenda is OSH&E curriculum update. Mr. Mauerman reported the following major requests for changes:

- 1) Chemistry 102/104 are prerequisites for Chemistry 261, which is currently listed earlier in the curriculum than the 102/104 classes. It was proposed that the prerequisite classes be moved up in the curriculum to before Chemistry 261.
- 2) Add OSHE 231 to the second year, second semester within the 2-year AAS degree curriculum.
- 3) Change the level of some classes to 400 from 300 (including OSHE 324 and 371), 300 from 200 (including 281 and 282), 100 from 200 (241) to meet requirements for ABET accreditation.

- 4) Add English 322 as a required course in the third year, second semester and delete Industrial Technology 322 as a required course from the third year, second semester to balance the credit hours.

The complete summary of request for change was distributed to the meeting members and is also attached in Appendix D.

Further issues regarding some courses on the curriculum were also discussed:

- 1) Chemistry 261 will be scheduled in the later afternoons on the Hammond campus in Spring 2009. Students may have to take the class at LSU so that it will not conflict with the OSHE classes at night. If none of these options is possible, the students need to discuss the matter with their advisor.
- 2) Mr. Steve Pereira pointed out the need for students to broaden and strengthen the accounting basics in order to understand the working principles of the business that hire them. Some other committee members agreed with him. Mr. Mauerman stated that students already take Economics 201 and that the basics of accounting are covered in that class. Jeremy Spears confirmed this statement. Mr. Mauerman recommended that the business school have input into this subject to ensure that students are learning about budgets, profit/loss and general accounting.
- 3) Mr. Pereira stated that he continues to believe that the program should expand the environmental aspect of the degree. Dr. Massawe specializes in Industrial Hygiene, Pollution Reduction and Cleaner Production, and will be responsible to work on that issue, along with the coordination from Mr. Mauerman.
- 4) Mr. Alan Rovira reiterated his recommendation on students taking biostatistics rather than elementary statistics from an Industrial Hygienist's perspective. Dr. Yuan felt that the biostatistics might be too advanced for the Bachelor degree level, but would be certainly a must for the Master degree level or higher.

The next item is OSH&E Course Specification Sheets (Appendix E). Such sheet consists of information regarding course description, minimum topics, and course objectives. Dr. Yuan reviewed the document with the group and tried to break the courses down into sub-disciplines. According the ABET requirements, it is very important that course description is explicit, the course covers sufficient and relevant minimum topics, and course objectives meet with PROGRAM mission goals and outcomes. Dr. Yuan requested that the committee members look for duplication or missing of course contents. He also requested that the committee members give feedback on those documents (particularly whether the course objectives satisfy the PROGRAM objectives and outcomes) before the end of November.

Mr. Mauerman then took a head-shoulder portrait on each meeting attendee. This photo, along with a biography which is requested from each committee member, will be posted on the OSH&E website later. Meanwhile, the meeting attendees answered a questionnaire (Appendix F) about opinions on the program aspects. So far, five completed questionnaires have been received, and it is greatly appreciated that other committee members could finish and return it ASAP.

The meeting adjourned at 12 PM and the committee members headed to the Luncheon room.





**Appendix A**  
**OSH&E Program**  
**Industrial Advisory Committee**

**Members**

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**Appendix B**  
**DEPARTMENT OF COMPUTER SCIENCE AND  
INDUSTRIAL TECHNOLOGY  
ADVISORY COMMITTEE MEETING**

**Friday, October 17, 2008**

**Agenda**

9:30-10:00 a.m.	<b>Registration with Coffee, Juice &amp; Pastries</b>	Room 139
	CSIT Faculty Welcomes Committee Members	
10:00	<b>General Assembly: Call to Order</b>	Room 139
	Mr. George Fairbanks, Advisory Committee Chairperson	
10:00 -10:05	<b>Welcome &amp; Comments from the Dean</b>	
	Dr. Dan McCarthy, Dean, College of Science & Technology	
10:05-10:15 a.m.	<b>Advisory Committee Address</b>	
	Mr. George Fairbanks, Advisory Committee Chairperson	
10:15-10:25 a.m.	<b>Departmental Progress Report</b>	
	Dr. Cris Koutsougeras, Department Head	
10:30-12:00	<b>Break-out by Degree</b>	
	Computer Science	Dr. Cris Koutsougeras Room 203 B
	Engineering Technology	Dr. Junkun Ma Room 127
	OSH&E	Mr. Lawrence Mauerman Room 122
	Industrial Technology	Dr. Roy Bonnette Room 139
	<b>Industrial Technology Subcommittee Meetings</b>	
	Automated Systems	Dr. Mike Asoodeh Room 104
	Drafting & Design	Dr. Mike Beauvais Room 111 B
	CTEC	Mr. Ed Rode Room 127
	Supervision	Dr. Pete Territo Room 139
12:00-1:00 p.m.	<b>Luncheon</b>	<b>Room 125</b>
1:00 – 2:00	<b>Tour of the Department's Labs</b>	

**Appendix C**  
**OSH&E Program**  
**Industrial Advisory Committee**

**Quarterly Meeting Agenda**  
October 17, 2008

<u>Time</u>	<u>Issues</u>	<u>Actions</u>
10:45 - 11:00 am	Welcome & Introduction	
11:00 - 11:10 am	OSH&E Curriculum Update	
11:10 - 11:40 am	OSH&E Course Specification Sheets	
	1. OSH&E Basics	
	2. Industrial Hygiene	
	3. OSH&E Management	
11:40 - 12:00 pm	Portraits, Bios & Questionnaire	
12:00 pm	Luncheon	

**Appendix D**  
**CURRICULUM IN OCCUPATIONAL SAFETY, HEALTH AND ENVIRONMENT**  
**LEADING TO THE DEGREE OF BACHELOR OF SCIENCE**

(SUMMARY OF CATALOG CHANGES FOR 2009-2010 CATALOG)

**NOTE: Only one Request for Change form has been completed for the changes covered in Groups 1, 2 and 3, below.**

**Group 1: Changes involving movement of a class from one semester to another only**

The changes in Group 1 are necessary to list courses in the General Catalog in the proper sequence to (1) meet prerequisites and (2) to offer them in the proper year for their degree program. These changes are necessary to meet requirements for ABET accreditation and as follow-up to recommendations made by the OSH&E Subcommittee to the Industrial Advisory Committee.

- Move Computer Science 110 or 173 from first year, first semester to first year, second semester and eliminate the Computer Science 110 option.
- Move OSHE 112 from first year, second semester to first year, first semester
- Move Psychology 101 from first year second semester to second year, first semester
- Move Zoology 241 from second year, first semester to third year, first semester
- Move OSHE 251 from second year, second semester to second year, first semester
- Move Chemistry 261 from second year, second semester to third year, second semester
- Move OSHE 261 from second year, first semester to second year, second semester
- Move OSHE 231 from third year, first semester to second year, second semester
- Move Chemistry 102 from third year, second semester to third year, first semester
- Move Chemistry Lab 104 from third year, second semester to third year, first semester
- Move OSHE 341 from fourth year, second semester to third year, second semester
- Move Professional Elective from fourth year, first semester to fourth year, second semester

**Group 2: Changes involving a change of course number only**

The changes in Group 2 are necessary to renumber courses in the General Catalog to properly reflect the year, sequence and course content in the OSH&E Bachelor of Science degree program. These changes are necessary to meet requirements for ABET accreditation and as follow-up to recommendations made by the OSH&E Subcommittee to the Industrial Advisory Committee.

- Renumber OSHE 281 (third year, first semester) as OSHE 381
- Renumber OSHE 371 (fourth year, first semester) to OSHE 471

**Group 3: Changes involving movement of a class from one semester to another and a change of a course number**

The changes in Group 3 are necessary both list courses in the General Catalog in the proper sequence and to renumber courses in the General Catalog to properly reflect the year, sequence and course content in the OSH&E Bachelor of Science degree program. These changes are necessary to meet requirements for ABET accreditation and as follow-up to recommendations made by the OSH&E Subcommittee to the Industrial Advisory Committee.

- Move OSHE 241 from second year, first semester to first year, second semester and change course number to OSHE 141
- Move OSHE 282 from third year, first semester to fourth year, second semester and change course number to OSHE 382
- Move OSHE 324 from fourth year, second semester to fourth year, first semester and change course number to OSHE 424

**Group 4: Other changes not covered above**

The changes in Group 4 are also shown on the attached curriculum listings from the 2008-2009 and 2009-2010 catalogs. They include more than shifts in semester and number, however. For this reason, **a separate Request for Change form has been completed for each one.**

- Delete Computer Science 110 as an option from the first year first semester.
- Delete Industrial Technology 322 as a required course from third year, second semester
- Add English 322 as a required course in third year, second semester
- Add Industrial Technology 492 as an option to Industrial Technology 391 in fourth year, second semester
- Change name of OSHE 111, Introduction to Safety and Health to OSHE 111, Introduction to Occupational Safety and Health
- Change name of OSHE 451, Industrial Waste Management to OSHE 451, Hazardous Materials Management, and change the course description to more accurately reflect the course content

# CURRICULUM IN OCCUPATIONAL SAFETY, HEALTH AND ENVIRONMENT LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

(AS IN 2008-2009 CATALOG)

The Bachelor of Science Degree program in Occupational Safety, Health and Environment is designed to enable graduates to enter business and industry as safety, industrial hygiene and environmental professionals.

<b>FIRST YEAR</b>			
FIRST SEMESTER	S.H.	SECOND SEMESTER	S.H.
English 101 .....	3	English 102.....	3
Mathematics 161 <sup>4</sup> .....	3	Mathematics 162 .....	3
OSHE 111.....	3	OSHE 112 .....	3
General Biology 151.....	3	OSHE 121. ....	3
Biology Lab 152.....	1	Psychology 101 .....	3
Computer Science 110 or 173.....	3		
Southeastern 101 .....	0-3		
	<hr style="width: 50%; margin: 0 auto;"/>		<hr style="width: 50%; margin: 0 auto;"/>
	16-19		15
<b>SECOND YEAR</b>			
Chemistry 101 .....	3	PHYS 191.....	3
Chemistry Lab 103 .....	1	PLAB 193.....	1
Mathematics 241 .....	3	<b>CHEM 261 .....</b>	<b>3</b>
Zoology 241.....	4	COMM 211 .....	3
OSHE 241.....	3	OSHE 251 .....	3
OSHE 261.....	3	OSHE 242 .....	3
	<hr style="width: 50%; margin: 0 auto;"/>		<hr style="width: 50%; margin: 0 auto;"/>
	17		16
<b>THIRD YEAR</b>			
Economics 201 .....	3	<b>Physical Science<sup>1</sup>.....</b>	<b>4</b>
English 230 or 231 or 232 .....	3	History 101 or 102 or 201 Or 202 .....	3
<b>OSHE 231.....</b>	<b>3</b>	Industrial Technology 242.....	3
<b>OSHE 281.....</b>	<b>3</b>	Industrial Technology 322.....	3
OSHE 282.....	3		
	<hr style="width: 50%; margin: 0 auto;"/>		<hr style="width: 50%; margin: 0 auto;"/>
	15		13
<b>FOURTH YEAR</b>			
OSHE 371.....	3	OSHE 321 .....	3
Management 351 .....	3	OSHE 324 .....	3
Arts <sup>2</sup> .....	3	OSHE 341 .....	3
Professional Elective <sup>3</sup> .....	3	Industrial Technology 391 <sup>3</sup> .....	3
Professional Elective <sup>3</sup> .....	3	Professional Elective <sup>3</sup> .....	3
	<hr style="width: 50%; margin: 0 auto;"/>		<hr style="width: 50%; margin: 0 auto;"/>
	15		15
Total semester hours required.....			122-125

<sup>1</sup> Select Chemistry 102/104 or Physics 192/194.

<sup>2</sup> Select one course in Art, Dance, or Music or Theatre.

<sup>3</sup> Professional electives should be selected in consultation with advisors.

<sup>4</sup> Students with an ACT Math score of 20 or lower will take Math 155 (5 credit hours) in place of Math 161, which will increase 2 credit hours the total number of hours required for the degree.

# CURRICULUM IN OCCUPATIONAL SAFETY, HEALTH AND ENVIRONMENT LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

(AS PROPOSED FOR THE 2009-2010 CATALOG)

The Bachelor of Science in Occupational Safety, Health, and Environment (OSH&E) program is designed to provide an academically comprehensive curriculum that prepares graduates with the ability and competency to become highly qualified safety, industrial hygiene, and environmental professionals.

## FIRST YEAR

### FIRST SEMESTER

English 101 .....	3
Mathematics 161 <sup>1</sup> .....	3
OSHE 111 .....	3
OSHE 112 .....	3
General Biology 151 .....	3
Biology Lab 152 .....	1
Southeastern 101 .....	0-3

16-19

### SECOND SEMESTER

English 102 .....	3
Mathematics 162 .....	3
Computer Science 173 .....	3
OSHE 121 .....	3
OSHE 141 .....	3

15

## SECOND YEAR

Chemistry 101 .....	3
Chemistry Lab 103 .....	1
Mathematics 241 .....	3
Psychology 101 .....	3
OSHE 251 .....	3

13

Physics 191 .....	3
Physics Lab 193 .....	1
Communication 211 .....	3
OSHE 231 .....	3
OSHE 242 .....	3
OSHE 261 .....	3

16

## THIRD YEAR

Chemistry 102 .....	3
Chemistry Lab 104 .....	1
Economics 201 .....	3
English 230 or 231 or 232 .....	3
Zoology 241 .....	4
OSHE 381 .....	3

17

Chemistry 261 .....	3
History 101 or 102 or 201 Or 202 .....	3
Industrial Technology 242 .....	3
English 322 .....	3
OSHE 341 .....	3

15

## FOURTH YEAR

OSHE 424 .....	3
OSHE 471 .....	3
Management 351 .....	3
Arts <sup>2</sup> .....	3
Professional Elective <sup>3</sup> .....	3

15

OSHE 382 .....	3
OSHE 421 .....	3
Industrial Technology 391/492 .....	3
Professional Elective <sup>3</sup> .....	3
Professional Elective <sup>3</sup> .....	3

15

Total semester hours required..... 122-125

<sup>1</sup> Students with an ACT Math score of 20 or lower will take Math 155 (5 credit hours) in place of Math 161, which will increase 2 credit hours the total number of hours required for the degree.

<sup>2</sup> Select one course in Art, Dance, Music or Theater

<sup>3</sup> Professional electives should be selected in consultation with advisors

## **Appendix E**

### **Mission and Goals**

### **Occupational Safety, Health, and Environment (OSH&E)**

The Bachelor of Science in Occupational Safety, Health, and Environment (OSH&E) program is designed to provide an academically comprehensive program that prepares graduates with the ability and competency to become highly qualified safety, industrial hygiene, and environment professionals. The educational objectives of the OSH&E program are to prepare students who:

- Apply knowledge and principles of mathematics, science, technology, and management in industry, business, or other related areas of employment as occupational safety, health, and environment professionals;
- Apply practical-oriented knowledge and skills in safety, health, and environment to anticipate, identify and evaluate hazardous conditions and practices, to develop hazard control designs, methods, procedures and programs, and to implement and manage effective safety, health, and environment programs;
- Become effective communicators and ethical facilitators within the practice of safety, health, and environment;
- Continue professional development to address the need of applying principles of safety, health, and environment within a constantly changing and increasingly diverse environment.

## **Major Field Assessment Plan Occupational Safety, Health, and Environment (OSH&E)**

The Bachelor of Science in Occupational Safety, Health, and Environment (OSH&E) program is designed to provide an academically comprehensive program that prepares graduates with the ability and competency to become highly qualified safety, industrial hygiene, and environment professionals.

The educational objectives of the OSH&E program are to prepare students who:

1. Apply knowledge and principles of mathematics, science, technology, and management in industry, business, or other related areas of employment as occupational safety, health, and environment professionals.

### Expected Outcomes

Students completing the Baccalaureate degree in OSH&E will demonstrate the ability to apply basic mathematical and scientific knowledge in the safety, health, and environment field.

### Assessment

In the selected relevant courses, the exams and assignments should be designed to reflect the course objectives. Students are able to score at least 75% on math, statistics, and science related problems in the exams and assignments.

2. Apply practical-oriented knowledge and skills in safety, health, and environment to anticipate, identify and evaluate hazardous conditions and practices, to develop hazard control designs, methods, procedures and programs, and to implement and manage effective safety and health programs.

### Expected Outcomes

Students completing the Baccalaureate degree in OSH&E will demonstrate the ability to anticipate, identify and evaluate safety, health, and environment hazards, and to develop and implement hazard control methods, programs, and system designs.

### Assessment

- In the selected relevant courses, students are able to solve technical problems regarding safety, health, and environment in the exams. Approximately 70% of the grade for each of those courses is based on the exam performance.
- In the selected relevant courses, students are able to anticipate, identify, evaluate, and control hazards by successfully conducting a research project in a simulated industrial work environment. Approximately 30% of the grade for each of those courses is based on the quality of the research project.



- For the selected relevant courses, students will score at least 75% of the overall grade which considers both the exams and research projects.
3. Become effective communicators and ethical facilitators within the practice of safety, health, and environment.

#### Expected Outcomes

Students completing the Baccalaureate degree in OSH&E will demonstrate the ability to express thoughts effectively in oral and written communications, and to understand ethical behaviors and professional responsibility.

#### Assessment

- In the majority of courses, students are required to either write a technical research paper, or make an oral presentation of project, or both. Approximately 30% of the grade for each of those courses is based on the quality of the research paper and/or presentation.
  - The exams in selected courses include questions regarding codes of professional ethics. Students are expected to answer right for those questions, if not, individual counseling or discussion will be issued.
4. Continue professional development to address the need of applying principles of safety, health, and environment within a constantly changing and increasingly diverse environment.

#### Expected Outcomes

Students completing the Baccalaureate degree in OSH&E will demonstrate the ability to broaden education and life-long learning necessary to understand safety, health, and environment issues within a global and social context.

#### Assessment

- Students are encouraged to become a member of ASSE (American Society of Safety Engineers) Southeastern Louisiana University student section and be actively involved in the events and activities organized by the student section.
- Students are encouraged to continue personal growth and improvement by pursuing the widely recognized certifications including Certified Safety Professional (CSP) and Certified Industrial Hygienist (CIH). As measured on the Southeastern Alumni Survey, 50% of the OSH&E graduates will become CSPs.

## **Course Specification Sheet**

### **OSHE 111 Introduction to Safety & Health**

#### **Course Description:**

This course presents general safety and health concepts and terms, historical developments, program concepts and terms, legislative overview including worker's compensation law, problem identification, hazard recognition, evaluation and control concepts, and program management.

#### **Minimum Topics:**

1. Historical Perspectives
2. Safety and Health Professions
3. Theories of Accident Causation
4. Regulatory History
5. Workers' Compensation
6. Loss Control Programs
7. Injury and Illness Record Keeping
8. Identifying Hazards
9. Safety Audit & Inspection
10. Accident Investigation and Analysis
11. Computers and Information Management
12. Safety Training & Promoting Safety

#### **Course Objectives:**

1. Describe the history of the safety movement in the United States, including significant safety legislation and the importance of worker's compensation.
  2. Describe important sources of loss control information.
  3. Demonstrate how loss control information is analyzed and used to develop effective loss control programs.
  4. Describe the organization of effective industrial health programs including the principles of occupational health, industrial hygiene and ergonomics.
  5. Demonstrate the organization of effective environmental programs, including the response to industrial emergencies.
- 
1. Describe the organization of effective safety programs, including employer and employee motivation; safety and health training; use of various types of media; and implementation and use of safety awareness programs.

## **Course Specification Sheet** **OSHE 112 Design of Hazard Controls**

### **Course Description:**

*Prerequisite: Current enrollment or prior credit for OSHE 111.* This course studies the application of scientific and engineering principles and methods to achieve optimum safety and health conditions through the analysis and design of process, equipment, products, facilities, operations, and environment. A variety of topics will be covered, including product design, plant layout, construction, maintenance, pressure vessels and piping, mechanical systems, materials handling and storage, ventilation, power tools, electrical equipment, confined space, and transportation vehicles and systems.

### **Minimum Topics:**

1. Hazard Control in General
2. Buildings and Plant Layout
3. Construction of Plant Facilities
4. Maintenance of Plant Facilities
5. Boilers and Unfired Pressure Vessels
6. Machine Safeguarding & Lockout/Tagout
7. Personal Protective Equipment
8. Electrical Safety
9. Fire Hazards and Life Safety
10. Materials Handling and Storage
11. Crane, Conveyor, and Rigging
12. Powered Industrial Truck
13. Hand and Portable Power Tool

### **Course Objectives:**

1. Identify a variety of occupational hazards.
2. Recognize information resources regarding occupational hazards.
3. Comprehend and apply basic principles and technologies to analyze and control occupational hazards.

## **Course Specification Sheet**

### **OSHE 121 Safety and Health Program Management and Administration**

#### **Course Description:**

*Prerequisite: Current enrollment or prior credit for OSHE 111.* This course addresses the application of management principles and techniques to the management of safety and health and loss control programs. Topics include planning, organizing, budgeting, resourcing, operating, implementing and evaluating safety functions.

#### **Minimum Topics:**

1. Introduction to Corporate Organization
2. Evolution of Modern Safety Concepts
3. OSHA Responsibilities and Implementation
4. Organization and Administration Effects
5. Safety Management
6. Cost Analysis
7. Performance Measurement and Motivation
8. Systems Safety Analysis
9. Employee Selection, Placement and Training
10. Psychological Aspects and Ergonomics
11. Product Safety

#### **Course Objectives:**

1. Describe the history of modern industrial safety management and explain how the principles of modern safety management developed.
  2. Discuss the safety roles and responsibilities of managers at the various levels of authority within a typical industrial organization.
  3. Describe the proactive elements of management systems that can be used to develop and implement effective safety programs.
- 
1. Describe the reactive elements of safety programs that are used in effective programs.

## **Course Specification Sheet**

### **OSHE 231 Safety Laws, Regulations, and Standards**

#### **Course Description:**

*Prerequisite: Current enrollment or prior credit for OSHE 111.* This course studies the development processes, sources, and applications for minimum safety requirements established by laws, regulations, standards, and codes. Major topics include OSHA General Industry and Construction Standards, the enforcement of safety standards, and the role of NIOSH and ACGIH in the safety movement.

#### **Minimum Topics:**

1. Laws, Regulations, Codes and Standards - What Are They?
2. The History of Federal Efforts to Regulate Industrial Safety
3. The Occupational Safety and Health Act of 1970
4. Other Federal Safety Regulations and Their Applications
5. Organization of the *Code of Federal Regulations* (CFR)
6. Making the CFR Easier to Use
7. Industry Standards-Making Organizations
8. Standards and Codes
9. Consensus Standards
10. OSHA Regulation Parts and Subparts
11. OSHA Compliance Standards and Performance Standards
12. OSHA Regulations as Minimum Safety Standards
13. Applications of OSHA Regulations

#### **Course Objectives:**

1. Describe the history and development of the Occupational Safety and Health Act of 1970 and list its major provisions. List other major pieces of federal legislation that affect industrial safety.
2. Demonstrate a mastery of how regulatory material found in the *Code of Federal Regulations* (CFR) is organized and presented.
3. Demonstrate knowledge of standards and codes developed by industry and private organizations which parallel, supplement and compliment federal regulations. Explain how these materials are used as “consensus standards”.
4. Demonstrate knowledge of the content of the safety regulations found in 29 CFR 1910 and 29 CFR 1926.

## **Course Specification Sheet**

### **OSHE 241 Principles of Industrial Hygiene**

#### **Course Description:**

This course introduces the basic industrial hygiene principles of anticipation, recognition, evaluation and control of workplace conditions as they relate to occupational health. Class discussion will focus on a variety of occupational hazards including air contaminants, chemical hazards, biological hazards and physical hazards.

#### **Minimum Topics:**

1. Fundamental Concepts of Toxicology
  - a. Definitions
  - b. Federal Regulations
  - c. Environmental Factors or Stresses
  - d. Industrial Toxicology
  - e. Modes of Entry of Harmful Agents
  - f. Types of Airborne Contaminants
  - g. Threshold Limit Values (TLVs), etc.
  - h. Evaluation
  - i. Occupational Skin Diseases
  - j. Control Measures
2. Anatomy, Physiology, Pathology
  - a. Lungs
  - b. Skin
  - c. Ear
  - d. Eyes
3. Recognition of Specific Environmental Factors or Stresses
  - a. Gases, Vapors and Solvents
  - b. Particulates
  - c. Industrial Dermatoses
  - d. Industrial Noise
  - e. Ionizing Radiation
  - f. Temperature Extremes
  - g. Ergonomics
  - h. Biological Hazards
4. Evaluation of Hazards
  - a. Evaluation
  - b. Methods of Evaluation
  - c. Air Sampling Instruments
  - d. Direct Reading Gas and Vapor Monitors
  - e. Medical Monitoring
5. Control of Environmental Hazards
  - a. Methods of Control
  - b. Ventilation: Local Exhaust and General
  - c. Personal Protective Equipment (PPE)
  - d. Control of Environmental Hazards

**Course Objectives:**

1. Describe the basic principles of industrial hygiene, i.e., the anticipation, recognition, evaluation and control of hazards in the workplace.
2. Describe the provisions of federal, state and industry regulations and guidelines regarding worker health on the job.
3. Apply the fundamental concepts of industrial hygiene in the work environment.
4. Describe specific environmental factors or stresses in the workplace and their potential health effects.
5. Demonstrate proper methods in the use and care of industrial hygiene instrumentation and personal protective equipment.

## Course Specification Sheet OSHE 242 Ergonomics

### Course Description:

*Prerequisites: Enrollment in or prior credit for Mathematics 241 and OSHE 111.* This course explores ergonomic design principles which involve the planning and adapting of equipment and tasks to promote the comfort and efficiency of workers. Major topics include: human characteristics, physiology, and anthropometry, and the application of these principles to workstations, tool design, and material handling procedures.

### Minimum Topics:

1. Introduction to Ergonomics
2. Human Anatomy, Posture, and Biomechanics
3. Anthropometry and Workstation Design
4. Standing VS. Sitting
5. How the Mind Works
6. Human Senses
7. Interaction with the Environment
8. Manual Material Handling
9. The Upper Body at Work
10. Hand-Tool Design
11. Physiology, Workload, and Work Capacity
12. Ergonomic Job Analysis
13. Psychosocial Stress and Work Organization

### Course Objectives:

1. Use different conceptual frameworks and models to understand the diversity of ergonomics subjects.
2. Understand the human musculoskeletal system and its relationship with the work that human performs.
3. Describe the importance and application of anthropometric information in the design of workstation, equipment, and tool.
4. Understand the differences between standing and sitting postures and their importance in proper workstation design.
5. Describe how body tissues respond to excessive loading and the basic principles for the design of hand tools and equipment.
6. Understand the biomechanics of shoulder and back injuries.
7. Summarize a variety of ergonomic risk factors for musculoskeletal disorders and intervention approaches to the redesign of work.



## **Course Specification Sheet OSHE 251 Environmental Laws and Practices**

### **Course Description:**

This course presents an introduction to federal and state environmental regulations which impact the safety function in industry. Major topics include hazardous waste management, disposal and cleanup, prevention of air, water, and soil contamination, and environmental program management.

### **Minimum Topics:**

1. The Difference between Laws and Regulations
2. Important Federal Publications
3. The *Code of Federal Regulations* (CFR)
4. History of Environmental Legislation
5. Chemical Use and Assessment Laws
  - a. Toxic Substances Control Act (TSCA)
  - b. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
  - c. Occupational Safety and Health Act (OSH Act)
6. Chemical By-Product Laws
  - a. Clean Air Act (CAA)
  - b. Clean Water Act (CWA)
  - c. Safe Drinking Water Act (SDWA)
7. Chemical Waste Disposal Laws
  - a. Resource Conservation and Recovery Act (RCRA)
  - b. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
  - c. Superfund Amendment and Reauthorization Act (SARA)
8. Chemical Transportation Laws.
  - a. Hazardous Materials Transportation Act (HMTA)
  - b. Hazardous Materials Transportation Uniform Safety Act (HMTUSA)

### **Course Objectives:**

1. Briefly describe the process by which a law passed by congress becomes a safety, health or environmental regulation.
2. Discuss the general history of safety and environmental legislation in the United States and the major factors and historic events which have influenced its development.
3. Be able to demonstrate a basic understanding of the purpose of a specific safety or environmental regulation by assigning it to one of the four major categories of environmental laws, i.e.: (1) Chemical Use and Assessment Laws; (2) Chemical By-Product Laws; (3) Chemical Waste Disposal Laws; and (4) Chemical Transportation Laws.
4. Identify and discuss the basic provisions of major environmental laws, and tell where, within the *Code of Federal Regulations* (CFR), the regulations resulting from the laws are found.
5. Define important terms and acronyms of safety and environmental regulations.

## **Course Specification Sheet**

### **OSHE 261 Fire Protection and Prevention**

#### **Course Description:**

This course introduces the basic principles of fire and fire prevention in the work place. Emphasis will be placed on evaluating existing and planned facilities from a fire and explosion standpoint, and applying the basic principles of hazard recognition, evaluation and control when developing fire prevention and emergency response activities.

#### **Minimum Topics:**

1. Fire in History and Contemporary Life
2. Understanding America's Fire Problem
3. Fire Behavior
4. Building Design and Construction
5. Concepts of Egress Design
6. Assessing Life Safety in Buildings
7. Fire Department Structure and Management
8. Fire Department Facilities and Equipment
9. Preventing Fire Loss
10. Controlling Fire Loss through Active Fire Protection Systems
11. Fire Investigation
12. Introduction to the NFPA 101 – Life Safety Code
13. Planning for Emergency Response
14. OSHA Requirements Relative to Fire Prevention and Emergency Action/Response Plans
15. Public and Private Support Organizations
16. Careers in Fire Protection

#### **Course Objectives:**

Upon completion of the course, students will be able to:

1. Define the term "fire"
2. Explain the Fire Triangle and Fire Tetrahedron
3. Explain various methods of fire and explosion control
4. List and explain the classes of fire
5. Describe characteristics of combustible solids such as wood, plastics, polymers and textiles
6. Define key terms relative to flammable and combustible liquids, gases and vapors as well as hazardous materials
7. Explain the NFPA/NEC Electrical Hazard Classification System
8. Describe the general procedure for conducting a fire investigation
9. Explain the elements of building fire safety
10. Compare and contrast the properties of wood, steel, concrete, glass, gypsum, masonry and plastics with respect to fire
11. Explain the concept of Flame Spread Ratings
12. Explain the concept of Fire Loading Based on Occupancy
13. Describe basic methods of smoke management
14. Explain NFPA 220 relative to the Types of Building Construction
15. Describe the economic benefits of sprinkler/deluge systems

16. Compare and contrast the dry pipe, wet pipe and deluge type systems
17. Explain the properties, characteristics and limitations of the following extinguishing agents:
  - CO<sub>2</sub>
  - Halon
  - Dry Chemical
  - Dry Powder
  - Nitrogen
  - Steam
18. Explain OSHA and NFPA requirements for the inspection and maintenance of fire extinguishing systems and portable fire extinguishers
19. Describe the services that can be performed by heat and smoke detection devices
20. Explain the purpose of the NFPA Life Safety Code
21. Explain the difference between a “specification” code and a “performance” code
22. Describe the relationships between Building Codes and Fire Codes
23. Describe OSHA requirements for:
  - Controlling Hot Work
  - Fire Watches
  - Emergency Action Plans
  - Fire Prevention Plans
  - Fire Brigades
24. Describe how to prepare a Welding, Burning/Hot Work Permit

## **Course Specification Sheet**

### **OSHE 281 Safety in Chemical and Process Industries**

#### **Course Description:**

*Prerequisites: Enrollment in or prior credit for Chemistry 101 and Physics 191.* This course presents the fundamentals of chemical and process industry safety. It includes a discussion of federal regulatory requirements; the major hazards inherent in chemical plants and petroleum refineries; and the methods used to identify, assess and eliminate those hazards. Chemical process safety is discussed in the context of case studies, providing students with the opportunity to examine real-life industry safety practices.

#### **Minimum Topics:**

1. Introduction to Chemical Process Safety
2. Federal Process Safety Management Regulations
3. Toxicology
4. Industrial Hygiene Principles
5. Source Models
6. Toxic Release and Dispersion Models
7. Characteristics of Flammable and Explosive Materials
8. Designs to Prevent Fires and Explosions
9. Causes of Over-pressurization
10. Introduction to Reliefs
11. Relief Sizing
12. Hazard Identification Methodologies
13. Risk Assessment Methodologies
14. Accident Investigations

#### **Course Objectives:**

1. Discuss the provisions of the federal Process Safety Management (PSM) regulations and describe how they are applied at typical industries in the area.
2. Identify the toxic effects of chemicals encountered in the industrial environment; and discuss how engineering controls are used to eliminate these hazards.
3. Discuss the physical characteristics of materials which make them flammable or explosive; and describe the controls that are used in the industrial setting to counter these hazards.
4. State the causes of over-pressurization in equipment and systems in the industrial environment; and describe the operation and use of devices to prevent its occurrence.
5. Describe how each of the formal Process Hazard Analysis (PHA) techniques discussed in class is used and list the advantages and disadvantages of each technique.
6. Complete a research project, based on an actual case history, which demonstrates mastery of the principles learned in the class.

## **Course Specification Sheet OSHE 282 Construction Safety**

### **Course Description:**

*Prerequisites: Enrollment in or prior credit for OSHE 111 and OSHE 121.* The course addresses the application of management principles, communication and human relations factors, safety/health rules, industry and federal standards, accident investigation, and technical issues especially within the job planning phases in the construction environment.

### **Minimum Topics:**

1. Construction Safety in General
2. Construction Safety Program
3. Workers' Compensation in Construction
4. Contractor Selection and Safety Requirement
5. Construction Safety Abuse Programs
6. Rewards/Incentives
7. Prejob/Pretask Planning
8. Accident Investigation and Reconstruction
9. Safety Training
10. Regulatory Requirements
11. Phase Planning for Site Preparation
12. Excavation, Concrete, and Steel Erection
13. Fall Prevention and Protection
14. Hazardous Materials & Confined Spaces
15. Mechanical and Electrical Systems

### **Course Objectives:**

1. Understand the importance of construction safety in an increasingly challenging and changing environment.
2. Describe the roles of organizations and personnel involved in major construction projects and how each affects site safety.
3. Describe how contractors and subcontractors can be qualified and selected for a construction project.
4. Understand how site safety programs can be coordinated among the many contractors on a construction site to provide the overall safety.
5. Describe the legal aspects including liability and regulatory requirements of construction safety.
6. Address many technical issues in construction, particularly the requirements and applications of safety planning in the early job phases.

## **Course Specification Sheet**

### **OSHE 311 Safety and Health Program Development**

#### **Course Description:**

This course presents the key elements necessary to develop or to assess occupational safety and health programs. Major topics include management commitment and employee involvement; worksite analysis; hazard correction and control; training, and evaluation.

#### **Minimum Topics:**

1. Assessment of Management Commitment
2. Obtaining Change Where Necessary
3. Supporting Management Efforts
4. Opportunities for Employee Involvement
5. Obtaining "Buy-in"
6. Effectiveness of Incentive Programs
7. Worksite Analysis Techniques
8. Conducting Worksite Analysis
9. Working with the Results
10. Methods of Hazard Control
11. Implementing Changes
12. Effective Training
13. Types of Training
14. Method of Evaluation
15. Using Feedback

#### **Course Objectives:**

1. Describe the elements of an effective occupational safety and health program, such as management commitment and employee involvement.
2. Develop a new occupational safety and health program for a company that has not previously had one.
3. Assess an existing occupational safety and health program.
4. Apply proven management principles to correct deficiencies discovered through the assessment of an occupational safety and health program.

## **Course Specification Sheet**

### **OSHE 321 Measurement of Safety Performance and Accident Investigation and Analysis**

#### **Course Description:**

*Prerequisite: Enrollment in or prior credit for Math 241.* This course presents methods to objectively evaluate a company's safety progress. The course covers two distinct topics: (1) safety performance measurement, and (2) incident investigation and analysis. The first segment of the course addresses ways of measuring safety performance objectively and subjectively using safety audits, inspections, observations, performance appraisal systems, and injury/illness statistics. The second segment of the course addresses the causes of accidents, systematic ways of conducting investigations, documenting the findings, causes and other significant data, and drafting recommendations.

#### **Minimum Topics:**

1. Introduction & Importance of Measurement
2. Traditional Safety Performance Indicators
3. Current Measurement Techniques
4. Injury and Illness Statistics
5. Performance Measurement Category 1
6. Performance Measurement Category 2
7. Systematic Approach of Measurement
8. Measurement Summary and Trends
9. Accident Investigation Basics
10. Preparing for Mishaps
11. Getting Underway with the Investigation
12. Human Aspects & Environment
13. Materials & Systems Investigation
14. Investigation Techniques 1
15. Investigation Techniques 2
16. Investigation Report and Overview

#### **Course Objectives:**

1. Understand the importance of performance measurement in the safety field.
2. Differentiate between current and previous safety performance measurement strategies.
3. Describe different measurement methodologies to evaluate and improve safety performance in different environments.
4. Understand the causes of accidents and incidents and discuss the need for investigation.
5. Develop systematic approaches to prepare, conduct, organize, and manage accident investigation.
6. Describe and apply various analytical techniques of accident investigation.

## **Course Specification Sheet OSHE 322 Behavior Aspects of Safety**

### **Course Description:**

*Prerequisites: Psychology 101.* This course will introduce students to the application of scientific research based principles and methods to bring about change in the work culture through attitude, behavior and environmental conditions. Specific topics will include traditional approaches and philosophies for improving safety, environmental effects, incentives, developing and building cultural change, identifying critical behavior, developing checklists, giving and receiving recognition, and measuring performance.

### **Minimum Topics:**

1. Elements of the Workplace System
2. Problems Using Psychological Approaches to Preventing Accidents
3. Core Concepts for the Course
4. Establishing Theories For Behavior-based Safety: The Total Safety Culture
5. Person-Based vs. Behavior-Based
6. The Required Paradigm Shift
7. The Nature of the Worker
8. Principles of Behavior
9. Critical Behaviors
10. Analysis of Behaviors
11. The Role of Activators
12. The Role of Consequences
13. Intervention for Change
14. Actively Caring
15. Promoting Teamwork
16. Obtaining Buy-in and Support

### **Course Objectives:**

1. List the components of a workplace; i.e., its human, situational and environmental components, and describe their interrelationships.
2. Explain how many current safety practices in the workplace are not effective reducing the number workplace incidents below present levels.
3. Describe the characteristics of a Total Safety Culture and list the elements that must be present in order to create such a culture.
4. Describe the characteristics of human nature that must be considered and understood in order to make meaningful, permanent changes in behavior that will promote safety.
5. Explain the principles upon which behavior is based.
6. Describe how critical behaviors can be defined, identified, observed and analyzed.



7. Describe how activators and consequences can be used to modify and mold behavior.
8. Describe the use of intervention in established behavior patterns to change them to include acceptable safety practices.
9. Explain how to obtain support and buy-in for a Total Safety Culture through behavior based safety efforts.

## **Course Specification Sheet OSHE 323 Product Safety and Liability**

### **Course Description:**

This course examines the importance of considering the safety of a product in its ultimate use. It considers aspects of product design; intended use and foreseeable misuse; and potential injury mechanisms. It uses classic products liability case studies to provide practical application of the principles learned. It also looks at manufacturer liabilities through injury tort actions.

### **Minimum Topics:**

1. Introduction and General Information
2. Product Liability Issues
3. Safety Costs and Losses
4. Standards and Criteria
5. Modern Concepts of Accident Prevention
6. Hazardous Characteristics of Products
  - a. Hazards which Cause Injury
  - b. Hazards which Cause Sickness
  - c. Malfunctions
  - d. Environmental Factors
  - e. Operator Error
7. Minimizing Accidents and Their Effects
8. Diagnostic Tools and Methodologies
  - a. Fault Tree Analysis
  - b. Failure Mode and Effect Analysis
  - c. Operating Hazard Analysis
9. Product Safety Program
10. Risk Assessment
11. Manufacturing the Safe Product

### **Course Objectives:**

1. Describe the basis for product liability lawsuits that can increase the costs and affect the profits of a company.
2. Discuss the state and federal agencies, and the statute laws that regulate product safety.
3. Discuss the production standards and other criteria that are applied to the manufacture of products for the market.
4. List and describe the possible conditions that can cause injury as result of the use of a product: i.e., malfunction, operator error, etc.
5. Demonstrate a knowledge of the analysis methods and techniques that can be employed to identify and correct potential hazards in manufactured products to prevent user injury.

## **Course Specification Sheet** **OSHE 324 System Safety Methodologies**

### **Course Description:**

*Prerequisites: Mathematics 241, OSHE 111, and OSHE 121.* This course presents the concepts of Risk Management and Loss Control through the use of systematic approaches to hazard anticipation, identification, evaluation and control. Major topics include: an introduction to qualitative methods of evaluating the hazards and risks associated with systems, processes, equipment, and other entities. It also includes a review of techniques for mitigating or managing identified risks.

### **Minimum Topics:**

1. System Safety Methodologies in General
2. Understanding Risk
3. Hazard Evaluation Scope and Preparation
4. Hazard Evaluation Meetings and Results
5. Hazard Identification Methods in General
6. Hazard and Operability Study (HazOp)
7. HazOp Case Study Step 1
8. HazOp Case Study Step 2
9. HazOp Case Study Step 3
10. Fault Tree Analysis (FTA)
11. FTA Case Study Step 1
12. FTA Case Study Step 2
13. System Safety Analysis Overview

### **Course Objectives:**

1. Understand the basic features of the following hazard evaluation techniques:
  - Safety Review
  - Checklist Analysis
  - Relative Ranking
  - Preliminary Hazard Analysis
  - What-if Analysis
  - What-if/Checklist Analysis
  - Hazard and Operability Analysis (HazOp)
  - Failure Modes and Effect Analysis
  - Fault Tree Analysis (FTA)
  - Event Tree Analysis (ETA)
  - Cause-Consequence Analysis
  - Human Reliability Analysis
2. Select the best hazard evaluation technique based on the conditions of the job and the desired output of the analysis.
3. Perform a simple hazard evaluation using one or more of the methods studied in the class.

## **Course Specification Sheet**

### **OSHE 341 Field Methods of Industrial Hygiene and Toxicology**

#### **Course Description:**

*Prerequisites: Math 241 and OSHE 241.* This course presents an examination of the methods used by the industrial hygienist for the identification and assessment of health hazards in the workplace. Major topics include: establishment and use of methodologies to sample and evaluate exposures to air contaminants (gasses, vapors, aerosols, and particulates), microorganisms and allergens, noise, heat, and cold stress, electrical and magnetic radiation, and ionizing and ultraviolet radiation. The course also includes equipment use, maintenance, and calibration.

#### **Minimum Topics:**

1. Basic Principles of Sampling
2. Occupational Exposure Limits (OELs)
3. Equipment
  - a. The Right Equipment of the Job
  - b. Calibration and Maintenance of Equipment
4. Methods
  - a. Use of Sampling Protocols
  - b. Error and Accuracy
  - c. Chain of Custody
5. Resources
  - a. NIOSH
  - b. OSHA
  - c. AIHA & ACGIH
  - d. Others
6. Sampling for Gases and Vapors
7. Sampling for Particulates
8. Sampling for Physical Hazards
  - a. Noise
  - b. Radiation
  - c. Barometric Hazards
  - d. Thermal Hazards

#### **Course Objectives:**

1. Design and implement an air sampling program for gases, vapors, aerosols and particulates.
2. Design and implement a sampling program for other health hazards such as microorganisms, heat and cold, and various radiation sources.
3. Describe the common analytical methods used by laboratories.
4. Select, calibrate and use the proper instruments for collecting samples.
5. Use statistical data to assist in making decisions to establish control methods.

## **Course Specification Sheet**

### **OSHE 371 Education and Training Methods for Occupational Safety and Health**

#### **Course Description:**

This course introduces the concepts of adult training and education with emphasis on occupational safety and health. Major topics include: instructional system design, including performing a training needs assessment tasks analysis, program design goals and objectives, performance evaluation, delivery methods and media; computer-based training methods; systems to manage costs; and record keeping.

#### **Minimum Topics:**

1. Management Involvement in Safety Training
2. The Role of the Supervisor in Safety Training
3. Facts about Safety Training
4. OSHA Requirements for Safety Training
5. Other Requirements
6. Determining Training Needs
7. Establishing Training Objectives
8. Determining Course Content
9. Developing Instructional Outlines
10. Use of Audio/Visual Aids and Equipment
11. Examination, Testing and Validation
12. Training Recordkeeping
13. Drills and Exercises
14. On-The-Job Training

#### **Course Objectives:**

1. Define and describe the differences between education and training.
2. Given a suitable training topic, develop a “map” for the steps in developing a training course.
3. Given a suitable training topic, perform a skills analysis.
4. Given an accurate skills analysis for a training topic, write a set of training objectives for that topic.
5. Given proper training objectives, develop a course of instruction designed to achieve the training objectives.
6. Develop a method of criterion testing that will demonstrate achievement of the objectives of the training.

## Course Specification Sheet OSHE 441 Industrial Toxicology

### Course Description:

*Prerequisites: General Biology 151, Zoology 241, and OSHE 241.* This course examines the effects of industrial toxicants on the human body. Major topics include: the discipline of toxicology, acute and chronic exposures and effects, routes and characteristics of exposures, target organs and systems, dose and response, and carcinogenesis. It also discusses the toxic characteristics of various classes of toxic materials.

### Minimum Topics:

1. General Principles of Toxicology
2. Absorption, Distribution, and Elimination of Toxic Agents
3. Biotransformation: A Balance between Bioactivation and Detoxification
4. Hematotoxicity: Chemically Induced Toxicity of the Blood
5. Hepatotoxicity: Toxic Effects on the Liver
6. Nephrotoxicity: Toxic Responses of the Kidney
7. Neurotoxicity: Toxic Responses of the Nervous System
8. Dermal and Ocular Toxicity: Toxic Effects of the Skin and Eyes
9. Pulmonotoxicity: Toxic Effects in the Lung
10. Immunotoxicity: Toxic Effects on the Immune System
11. Reproductive Toxicity
12. Mutagenesis and Genetic Toxicology
13. Chemical Carcinogenesis
14. Properties and Effects of Metals
15. Properties and Effects of Pesticides
16. Properties and Effects of Organic Solvents
17. Properties and Effects of Natural Toxins and Venoms

### Course Objectives:

1. Describe and define the general principles of toxicology, including terminology; the dose response relationship; routes of entry; absorption, distribution, and elimination of toxic agents; and biotransformation of substances in the body.
2. Describe the adverse effects caused by various toxic agents on specific tissues and organs including the liver, blood, kidneys, nervous system, skin, eyes, lungs, and immune system.
3. Discuss toxicological areas of special concern including reproductive toxicology and carcinogenesis.
4. Discuss adverse health effects associated with selected classes of chemical agents including metals, pesticides, organic solvents, and naturally occurring toxins.
5. Describe the role and application of toxicology in modern times, including risk assessment, public health, epidemiology, and control strategies.

## **Course Specification Sheet** **OSHE 451 Industrial Waste Management**

### **Course Description:**

*Prerequisite: OSHE 251.* This course examines acceptable policies, procedures, and methods for the handling of oil and hazardous wastes produced by industry. Major topics include: advanced aspects of risk assessment, applicable environmental legislation, waste characterization and site assessment, waste minimization and recovery, chemical, physical, and biological waste treatment, thermal waste treatment, landfill disposal and injection well disposal. It also includes a section on the transportation of hazardous wastes.

### **Minimum Topics:**

1. Introduction & Overview
2. Administration and Regulatory Requirements
  - a. RCRA
  - b. HAZWOPER
  - c. HazCom
  - d. Others (DOE, DOT, etc.)
3. Hazardous Materials and Hazardous Wastes
  - a. Defining HazMat and Hazardous Waste
  - b. HazMat/Hazardous Waste Exposures
  - c. Personal Protective Equipment - Selection and Use
  - d. Monitoring Methodologies
4. Waste Minimization
5. On-Site Waste Management
6. Waste Treatment and Disposal Technologies
7. Waste Transportation
8. Emergency Response Organization and Planning
9. Emergency Response Methods
10. Emergency Response Equipment

### **Course Objectives:**

1. Describe state and federal requirements for management of waste and hazardous waste materials, as found in 40 CFR 240 to 271.
2. Analyze an industrial facility's produced waste and develop a program to effectively and efficiently manage that waste.
3. Describe the operation of a treatment, storage, and disposal (TSD) facility, and how to select a TSD facility to meet a company's waste disposal requirements.
4. Describe the various methods of treating or disposing of hazardous waste, i.e., incineration, injection, impoundments, etc., and give the advantages and disadvantages of each type.
4. Respond to a simulated emergency involving hazardous materials, demonstrating proper, safe methods for hazard identification, evaluation, and control.

**Appendix F**  
**OSH&E Program**  
**Industrial Advisory Committee**

**Quarterly Meeting Questionnaire**

October 17, 2008

The following questions are based on the nine criteria for accrediting Applied Science programs from ABET. It will take approximately 20 minutes to finish. Your kindly response is very much appreciated!

1. Students

1) How do you feel about the competencies of Southeastern's OSH&E Bachelor Degree Program graduates?

- Very good       Good       Just OK       Not good enough       Not applicable

2) What knowledge and skill(s) do you feel that the students enrolled in Southeastern's OSH&E Bachelor Degree Program need to strengthen? (Please select all that applies and rank them using numbers where 1 means the highest!)

- Mathematical and statistical knowledge  
 Communication skills  
 Multi-disciplinary teamwork  
 Practical-oriented knowledge and skills  
 Others (Please specify!) \_\_\_\_\_

2. Program Educational Objectives

1) How do you feel about the description of Southeastern's OSH&E Bachelor Degree Program Mission and Goals?

- Very good       Good       Just OK       Not good enough       Not applicable

3. Program Outcomes

1) How do you feel about the description of Southeastern's OSH&E Bachelor Degree Program Major Field Assessment Plan?

- Very good       Good       Just OK       Not good enough       Not applicable

2) Which specific program outcome(s) do you feel that should be emphasized or prioritized? (Please select all that applies and rank them using numbers where 1 means the highest!)

- Ability to apply basic mathematical and scientific knowledge in the safety, health, and environment field  
 Ability to anticipate, identify, and evaluate safety, health, and environmental hazards  
 Ability to develop and implement hazard control methods, programs, and system designs  
 Ability to express thoughts effectively through oral and written communications  
 Others (Please specify!) \_\_\_\_\_

4. Continuous Improvement

1) In your opinion, what is the best way to assure continuous improvement of the program? (Please select all that applies and rank them using numbers where 1 means the highest!)

- Reach industrial employers for recommendation  
 Consult colleagues from the institutional organizations that have already been accredited



- Build close and consistent connection with OSH&E industrial advisory committee
- Others (Please specify!) \_\_\_\_\_

5. Curriculum

1) How do you feel about the overall course offerings of Southeastern's OSH&E Bachelor Degree Program?

- Very good
- Good
- Needs adding more courses, such as \_\_\_\_\_
- Needs deleting some courses, such as \_\_\_\_\_

2) Which academic discipline(s) should the program emphasize, considering the local industrial environment? (Please select all that applies and rank them using numbers where 1 means the highest!)

- Industrial Hygiene
- Ergonomics
- Environmental Protection
- Safety & Security
- Others (Please specify!) \_\_\_\_\_

6. Faculty

1) How do you feel about the qualifications and competencies of faculty (both full-time and adjunct) for Southeastern's OSH&E Bachelor Degree Program?

- Very good
- Good
- Just OK
- Not good enough
- Not applicable

2) How do you feel about the numbers of full-time faculty for Southeastern's OSH&E Bachelor Degree Program?

- Very good
- Good
- Just OK
- Not good enough
- Not applicable

7. Facilities

1) How do you feel about the importance of scientific laboratories and associated equipment for occupational safety and health field?

- Very important
- Important
- Just OK
- Not so important
- Not applicable

2) What kind of laboratories do you feel that should be established for Southeastern's OSH&E Bachelor Degree Program? (Please select all that applies and rank them using numbers where 1 means the highest!)

- Industrial Hygiene Lab
- Ergonomics Lab
- Safety Engineering Lab
- Fire/Hazardous Materials Lab
- Others (Please specify!) \_\_\_\_\_

8. Support

1) In your opinion, which channel(s) should Southeastern's OSH&E Bachelor Degree Program try through which to obtain institutional support, financial resources, and constructive leadership? (Please select all that applies and rank them using numbers where 1 means the highest!)

- Internal program budget

- External educational grant
- Industrial sponsorship
- Others (Please specify!) \_\_\_\_\_

2) How do you feel the local industry’s support on Southeastern’s OSH&E Bachelor Degree Program?  
 Very good       Good       Just OK       Not good enough       Not applicable

9. Program Criteria

1) How do you feel about the overall quality of Southeastern’s OSH&E Bachelor Degree Program?  
 Very good       Good       Just OK       Not good enough       Not applicable

2) Which area(s) of the program do you feel that should be strengthened? (Please select all that applies and rank them using numbers where 1 means the highest!)

- Program objectives and outcomes
- Course offerings
- Student recruitment
- Faculty qualifications and competencies
- Facilities and laboratories
- Others (Please specify!) \_\_\_\_\_

Please feel free to write any other comments below!

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