

Principles of Industrial Hygiene (EPCT 1341)



Credit: 3 semester credit hours

Prerequisite: SCIT 1494 or equivalent

Course Description

Basic concepts in threshold limits, dose response, and general recognition of occupational hazards, including sampling statistics, calibration and equipment use. A study of the control of occupational hazards and sample collection and evaluation methods.

Required Textbook and Materials

1. Fundamentals of Industrial Hygiene by Barbara A. Plog & Patricia J. Quinlan, 5th edition, NSC Press
 - a. ISBN number is 9780879122164
2. One, 11/2 – 2 inch 3 ring binder with pockets
 - a. Notebook paper for binder
 - b. *Organization of notebook; contents should include:
 - Cover page with first and last name
 - Title of course
 - Day and time of weekly class meeting
 - Semester (example, “Fall 2009”)
 - Dividers labeled, syllabus, PPT. lectures, study questions, handouts, exams

Course Objectives

Upon completion of the course the student will be able to:

1. Explain terminology and discuss concepts of industrial hygiene and toxicology (SCANS: C5.3, C7.3, F1.4, F5.1, F11.2)
2. Describe the anatomy and function of the routes of entry (SCANS: C5.3, C6.2, C7.2, C8.2, F1.5, F2.3, F5.1, F6.1, F10.1)
3. Explain the workings of the major body systems; (SCANS: C5.3, C6.2, C7.2, C8.2, F1.5, F2.3, F5.1, F6.1, F10.1)
4. Identify major health hazards found in the workplace and discuss their effects; (SCANS: C5.3, C6.3, C7.4, C14.1, F1.4, F2.4, F5.1, F6.1, F8.3, F9.3)
5. Apply threshold limit values and other appropriate workplace exposure standards (SCANS: C5.3, C6.3, C7.4, C14.1, F1.4, F2.3, F3.3, F5.3, F6.1, F9.3, F13.3)
6. Prepare a report based on research and investigation of an area of industrial hygiene. (SCANS: C1.3, C5.3, C6.3, C7.4, C8.3, F1.4, F2.4, F8.3, F9.3, F13.3, F16.3)

SCANS Skills and Competencies

Beginning in the late 1980's, the U.S. Department of Labor Secretary's Commission on Achieving Necessary Skills (SCANS) conducted extensive research and interviews with business owners, union leaders, supervisors, and laborers in a wide variety of work settings to determine what knowledge workers needed in order to perform well on a job. In 1991 the Commission announced its findings in *What Work Requires in Schools*. In its research, the Commission determined that "workplace know-how" consists of two elements: foundation skills and workplace competencies.

Course Outline

- A. Welcome to LIT:
 - 1. Introduction of faculty and students
 - 2. Expectations
 - 3. Policies
- B. Industrial Hygiene
 - 1. What is it? (Overview)
 - 2. Federal Regulations
- C. Lungs
 - 1. Anatomy
 - 2. Respiration
 - 3. Hazards
 - 4. Natural defenses
 - 5. AMA guides for evaluating impairment
- D. Skin and Occupational Dermatitis
 - 1. Anatomy
 - 2. Physiology and functions
 - 3. Defense mechanisms
 - 4. Causes of occupational skin disease
 - 5. Predisposing factors
 - 6. Classification of occupational skin disease
 - 7. Prevention and control
- E. The Ears
 - 1. Anatomy and physiology
 - 2. The hearing process
 - 3. Effects of noise exposure
 - 4. Evaluating impairment (AMA Guides)
- F. The Eyes
 - 1. Anatomy
 - 2. Visual performance
- 3. Physical Hazards
- G. Gases, Vapors, and Solvents
 - 1. Toxicological effects
 - 2. Physiological effects
- H. Industrial Toxicology
 - 1. Definition
 - 2. Routes of entry
 - 3. Dose-response relationship
 - 4. Timing: exposure and effect
 - 5. Systemic toxins
- I. Particulates
 - 1. Background/basic concepts, procedures, and examples
 - 2. Crystalline, structural, and isotopic nature
 - 3. Shape of the particles
 - 4. Size of the particles
 - 5. Dose
 - 6. Concurrent exposure to other toxic agents
 - 7. Biological reactions
- J. Industrial Noise
 - 1. Hearing ability
 - 2. Risk factors
 - 3. Analysis of noise exposure
- K. Ionizing Radiation
 - 1. Ionizing radiation terms
 - 2. Biological effects of radiation
- L. Nonionizing Radiation
 - 1. Types of nonionizing radiation
 - 2. Biological effects
 - 3. Exposure standards
- M. Thermal Stress
 - 1. Degrees of thermal stress

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|-------------------------------|--------------------------------|
| 2. Recognition of heat stress | 2. Risk assessment |
| 3. Cold stress | 3. Current topics in biosafety |
| N. Biological Hazards | 4. Bioterrorism |
| 1. Hazard identification | |

Grade Scale

A = 90-100

B = 80-89

C = 70-79

D = 60-69

F = Less than 60

*Notebooks will be graded the evening of the final.

Course Evaluation

Final grades will be calculated according to the following criteria:

Test I	20%
Test II	20%
Final	35%
Report	15%
Notebook	10%

Course Requirements

1. Prepare a written report based on research and investigation of an area of industrial hygiene.
2. Maintain a notebook.
3. Participation in class activities and discussions.

Course Policies

1. Students are expected to come to class prepared. *Being prepared is defined as having the textbook, notebook, pen/pencil, paper, calculator, and completed assignments (such as study questions).*
2. Late work is unacceptable.
3. *There are no makeup tests.*
4. No extra credit will be awarded so please don't ask.
5. Cheating on a test will result in an "F" for the course. Please review the "Code of Conduct & Disciplinary Policy" and "Academic Dishonesty" on pages 34 through 36 of the LIT Catalog and Student Handbook.

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6. Attendance. Five points will be added to the final grade average for *perfect attendance*. Perfect attendance means not missing any classes or any portion of a class. This includes not having any tardies or leaving class early. Four tardies equals one absence.
7. You are expected to be in class (in your seat on time.) If you do find yourself in the position of arriving late due to unavoidable circumstances, enter the classroom with the *least* amount of disruption possible. Some lectures are only 45 minutes in length and coming in late is unacceptable.
8. Students are expected to remain in class the entire class period unless dismissed by the instructor.
9. Drop/Add/Withdraw. *It is the student's responsibility to make sure you are officially enrolled or dropped from this course.* If at any point, you decide to drop the class, it is your responsibility to officially drop (i.e., using proper administrative offices/paperwork.) Any student who stops attending class and does not officially drop the course will be given an "F" as the semester grade.
10. Silence all electronic devices such as cell phones, beepers, headphones and any other electronic communication devices.
11. No eating or drinking in the classroom.
12. Please do not bring children to class.
13. No tobacco products are allowed in class.
14. *In the case of disruptive behavior, the instructor reserves the right to ask you to leave the classroom. The instructor also reserves the right not to allow you back in the class.*

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator, at (409) 880-1737 or visit her office located in the Cecil Beeson Building, room 116B.

Course Schedule

Week 1	Course Introduction and Policies	
Week 2	Chapter 1: Overview of Industrial Hygiene	pp. 3-16, 20-26
Week 3	Chapter 2: The Lungs	pp. 35-48
Week 4	Chapter 3: The Skin and Occupational Dermatoses	pp. 51-70
Week 5	Chapter 4: The Ears & Chapter 5: The Eyes	pp. 83-87, 92-96, 99-114
Week 6	Test I	

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Week 7	Chapter 6: Industrial Toxicology	pp. 123-148
Week 8	Chapter 7: Gases, Vapors, and Solvents	pp. 149-162
Week 9	Chapter 8: Particulates	pp. 169-185
Week 10	Chapter 9: Industrial Noise	pp.208-216, 222-226, 227-230
Week 11	Test II	
Week 12	Chapter 10: Ionizing Radiation	
Week 13	Chapter 11: Nonionizing Radiation	
Week 14	Chapter 12: Thermal Stress	
Week 15	Chapter 14: Biological Hazards	
Week 16	Final	

*The order in which topics are covered is subject to change. Tests dates are also subject to change.