

Industrial Hygiene Applications* (EPCT 2331)



Credit: 3 semester credit hours (lecture)

Prerequisite: Math 1332 or equivalent, SCIT 1494, and SCIT 1418

Course Description

A study of the industrial environment and its relation to worker's health. This course provides training in anticipation, recognition, evaluation, and controlling health hazards—particularly chemical, physical, biological, and ergonomic factors existing in the workplace and having injurious effects on workers. The course also introduces training in instrumentation used in monitoring and measuring health hazards in the workplace and covers current issues in industrial hygiene.

Required Textbook and Materials

1. Fundamental of Industrial Hygiene by Barbara A. Plog & Patricia J. Quinlan, 5th edition, NSC Press
 - a. ISBN # 9780879122164

Course Objectives

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

1. Analyze samples of air, water, and soil in reference to OSHA standards. (SCANS: C1.5, C3, C5.5, C7.5, C9.4, C12.4, C14.4, C15.5, C18.5, F1.5, F3.5, F4.5, F6.4, F9.5, F11.4, F13.5, F16.4, F17.5)

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

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| <p>A. Welcome to LIT:</p> <ol style="list-style-type: none">1. Introduction of faculty and students2. Expectations3. Policies <p>B. Respiratory Protective Programs</p> <ol style="list-style-type: none">1. Exposure assessment of respirator wearers2. Medical evaluations of respirator wearers | <ol style="list-style-type: none">3. Respirator fit, training, and maintenance <p>C. Classes of Respirators</p> <ol style="list-style-type: none">1. Air-purifying devices2. Atmosphere-supplying respirators3. Combination air-purifying and atmosphere-supplying devices <p>D. Respirator selection</p> |
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1. Selection requirements
 2. Hazard determination
 3. Selection steps
 4. Effective protection factor
- E. Respirator Fit Testing
1. Qualitative fit testing
 2. Qualitative fit
 3. Test protocols
 4. Quantitative fit testing
 5. Quantitative fit test protocol
 6. Positive pressure respirators
- F. General Industry Standard for Respirators
1910.134 Specific guidelines
Training
- G. Ventilation
1. Local exhaust ventilation
 2. System components
 3. Airflow and pressure principles
 4. LEV performance evaluation and improvement
 5. Velocity measurements
 6. Static pressure measurements
- H. Dilution Ventilation Systems
1. Natural ventilation
 2. Mechanical ventilation
- I. System Design Considerations
1. Safety factors
 2. Dilution ventilation system layout
- J. Calculating Dilution Airflow for Health Protection
1. For health
 2. Steady-state
 3. Purging
 4. Dilution airflow design date
- K. Measuring Dilution Performance
1. Smoke tubes
 2. Volumetric airflow
 3. Velometers
- L. General Ventilation of Nonindustrial Occupancies
1. Energy conservation versus indoor air quality
 2. HVAC systems-zones
 3. Testing, troubleshooting, and maintaining HVAC systems
- M. Evaluation of Hazards
1. Evaluation
 2. Air sampling
 3. Direct-reading instruments for Gases, Vapors, and Particulates
- N. Noise
1. Sound measuring instruments
 2. Sound surveys
 3. Noise control programs
- O. Degrees of Thermal Stress
1. Recognition, evaluation and control of heat stress
 2. Recognition, measurement, evaluation and control of cold stress
- P. Radiation
1. Control programs
 2. Sources of radiation
 3. Operational factors
 4. Employee exposure potential
 5. Records
- Q. Ergonomics
1. Engineering anthropometry
 2. Measuring techniques-Biomechanics

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 1	20%
Test 2	20%
Test 3	20%
Final	30%
Participation	10%

Course Requirements

Homework is a course requirement and is expected to be complete by the next class meeting. Student will demonstrate competency in performing I.H. skills such as using monitoring equipment, the care, selection, and use of respirators, and calculations required for ventilation.

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.
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.

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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 116.

Course Schedule

Week 1	Respiratory Protection	pp. 195-244
Week 2	Respiratory Protection	
Week 3	NIOSH Decision Tree for Selection of a Respirator	pg. 198
Week 4	1910.134 Respiratory Standard	OSHA.gov
Week 5	Test I	
Week 6	Ventilation (ACGIH Ventilation Manual)	Instructor
Week 7	Ventilation (ACGIH Ventilation Manual)	Instructor
Week 8	Test II	
Week 9	Ventilation (ACGIH Ventilation Manual)	Instructor
Week 9	Ventilation (ACGIH Ventilation Manual)	Instructor
Week 10	Test III	
Week 11	Control of Noise	Instructor
Week 12	Control of Heat & Radiation	pp. 216-217, 781
Week 13	Ergonomics-Controls	Instructor
Week 14	Other Control methods (Substitution, Administrative, Engineering)	
Week 15	Final	