PubH 5330 Industrial Hygiene Chemical Hazard Control
Fall Semester 2016

Instructor
Carl Farley
BNR 323
carl.farley@usu.edu

Lectures and Laboratory
3 hours per week of lecture [MWF 9:30-10:20 Engineering 206]
1 hour per week laboratory [M 2:00-2:50, W 2:23-3:20 BNR 014]

Textbook
Industrial Hygiene Control of Airborne Chemical Hazards, W. Popendorf, 2006.

Course Material
Syllabus, Lecture Notes, Assignments and Laboratories can be downloaded off of **USU CANVAS**

Course Goals
Students will further explore:

- Principles and physical mechanisms that affect exposures to vapors and aerosols
- Interpreting some occupational health and safety regulations from a physical perspective
- Applications of principles and physical mechanisms to exposures
- Source controls and non-ventilation pathway controls
- Local exhaust ventilation
- Dilution ventilation

Grading
50% Exams: Three one-hour exams (open and closed book format)
20% Assignments: both homework & lab assignments
30% Final Exam

Approximate grading scale:

A: ≥ 92%
A-: ≥ 90%
B+: ≥ 87%
B: ≥ 82%
B-: ≥ 80%
C+: ≥ 77%
C: ≥ 72%
C-: ≥ 70%
D+: ≥ 67%
D: ≥ 60%
Greater than 60% is required to pass

Practice Problem Assignments
The lowest homework assignment grade is dropped. Due dates for each assignment are listed on the class schedule. To receive consideration for full credit assigned problem sets need to be turned in on the due date by the beginning of the start of class. 10% will be docked each week day the assignment is turned in late, up to one week (after which the assignment will no longer be accepted.

Exams
The exams (mid-terms and final) are formatted where approximately half of the exam will be closed book and half will be open book (text book/notes).

Course Fees
There are no course fees associated with this course. There are lab fees of $75 per student.

Special Needs
Students with physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. All accommodations are coordinated through the Disability Resource Center (DRC) in Room 101 of the University Inn, 797-2444 voice, 797-0740 TTY, or toll free at 1-800-259-2966. Please contact the DRC as early in the semester as possible.

Day	Date	Lecture Topic	Text
M	28-Aug	Introduction to Chemical Hazard Control	Chap. 1
W	30-Aug	The Physical Nature of Gases and Vapors	Chap. 2
F	1-Sep	Gas and Vapor Density	"
M	4-Sep	*Labor Day (no class on Monday)*	
W	6-Sep	Characteristics of Aerosols	Chap. 3
F	8-Sep	Behavior of Aerosols	"
M	11-Sep	Health, Safety, and OSHA Control Criteria	Chap. 4
W	13-Sep	Vapor Generation, Dispersion, and Exposure	"
F	15-Sep	Predicting Vapor Exposures in Closed Space	Chap. 5
M	18-Sep	Exposures in Ventilated Environments	"
W	20-Sep	Exposures and Hazards from Mixtures	Chap. 6
F	22-Sep	Vapors from Mixtures of Solvents	"
M	25-Sep	Changes within the Workplace	Chap. 7
W	27-Sep	**FIRST ONE-HOUR EXAM (open and closed book)**	
F	29-Sep	Chemical Source Substitution Control	Chap. 8
M	2-Oct	The Vapor Hazard Ratio in Chemical Substitutions	"
W	4-Oct	Other Non-ventilation Pathway Controls	Chap. 9
F	6-Oct	An Overview of Local Exhaust Ventilation	Chap. 10
M	9-Oct	The Local Exhaust Ventilation Design Process	"
W	11-Oct	Local Exhaust Ventilation Pressures **(also Utah Annual Safety & IH Conference)**	Chap. 11
F	13-Oct	Air Velocity and Anemometers	Chap. 12
M	16-Oct	The Boundary Layer and introduction to Hood Design Ventilation Hood Design Principles	Chap. 13
W	18-Oct	Control Velocity and the DallaValle Equation	"
F	20-Oct	**Fall Break- No Classes**	
M	23-Oct	Control Velocity and the DallaValle Equation	"
W	25-Oct	VS Diagrams & other Ventilation Hood Designs	"
F	27-Oct	**SECOND ONE-HOUR EXAM (open and closed book)**	
M	30-Oct	Energy Losses in Hoods and Straight Ducts	Chap. 14
W	1-Nov	Example Calculation of Losses	"
F	3-Nov	Energy Losses in Duct Fittings	"
M	6-Nov	Exhaust Air Cleaners and Exhaust Stacks	Chap. 15
W	8-Nov	Fan Pressures and Major Fan Types	Chap. 16
F	10-Nov	Fan Laws and Fan Selection	"
M	13-Nov	Fan Operating and Make-up Air Costs	Chap. 17
W	15-Nov	Continue Fan Operating and Make-up Air Costs	"
F	17-Nov	LEV Monitoring and Troubleshooting	Chap. 18
M	20-Nov	Post-Installation Adjustments	"
W&F	22-Nov	**and 11/24 Thanksgiving Holiday (No Class)**	
M	27-Nov	**THIRD ONE-HOUR EXAM (open and closed book)**	
W	29-Nov	The General (Dilution) Ventilation *Model*	Chap. 19
F	1-Dec	Dilution Ventilation in Transient Conditions	"
M	4-Dec	Dilution Ventilation in Steady State Conditions	Chap. 20
W	6-Dec	Estimating Contaminant Generation Rates	"
F	8-Dec	Commercial HVAC Systems and Indoor Air Quality and Review as time and interest permit	"
W	13-Dec	**Comprehensive Final Exam 9:30-11:20**	