

PubH 4330 Industrial Hygiene Physical Hazards

Spring Semester 2021

Lecture Tue and Thur 9:00 - 10:15 in LSB 214,

Laboratory: Mon 2:30-5:20; Wed 2:30-5:20, LSB 214

Instructors: John Flores, BNR 321; 797-8194, and Rachel Curry, GEOL 11; 797-3514

Prerequisite PubH 3310 or 4310

Textbook: *The Occupational Environment – Its Evaluation, Control, and Management* 3rd ed.

Edited by Daniel H. Anna PhD, CIH, CSP

AIHA Press, 2011;

ISBN: 9781935082156

Hr	Day	Date	Lecture Topic	Lec	Textbook Readings	Lab Schedule is Wed, Fri, Mon Laboratory Topic	
1	Tu	Jan 19	Course Organization and Introduction	JF		No lab this week	
2	Th	Jan 21	Noise Recognition: Definitions and Physiology	JF	3 rd ed. Ch. 24		
3	Tu	Jan 26	Physiology, Normal Hearing and Hearing Loss	JF		Lab 1: Noise and NIHL;	
4	Th	Jan 28	Noise Evaluation: Noise Exposure Limits	JF	3 rd ed. Ch. 24	Mon 1/25; Wed 1/27;	
5	Tu	Feb 2	Instruments and Monitoring	JF		Lab 2: Noise Instruments	
6	Th	Feb 4	Noise Control Concepts and Noise Source Controls	JF	3 rd ed. Ch. 24	Mon 2/1; Wed 2/3;	
7	Tu	Feb 9	Noise Source Controls and Near Field Noise Controls	JF		Lab 3: Noise Propagation;	
8	Th	Feb 11	Near-Field Noise Controls	JF		Mon 2/8; Wed 2/10;	
	Tu	Feb 16	FIRST ONE-HOUR EXAM (noise part I)			Lab 4: Noise Dosimetry;	
9	Th	Feb 18	Free-Field Noise Controls	JF		Wed 2/17; Mon 2/22;	
10	Tu	Feb 23	Reverberant Field Noise Control	JF		Lab 5: Noise Enclosure (Pathway) Control;	
11	Th	Feb 25	Receiver Noise Controls	JF		Wed 2/24; Mon 3/1;	
12	Tu	Mar 2	Vibration Recognition	JF	3 rd ed. Ch. 24	Lab 6 Noise PPE and NRR;	
13	Th	Mar 4	Evaluation and Control	JF		Wed 3/3; Mon 3/8	
14	Tu	Mar 9	Non-ionizing Radiation (the spectrum)	JF	3 rd ed. Ch. 25	Lab 7: IR, Visible, UV Light;	
	Th	Mar 11	SECOND ONE-HOUR EXAM (noise part II & vibration)			Wed 3/10; Mon 3/15;	
15	Tu	Mar 16	Optical and near-optical Radiation	JF	3 rd ed. Ch. 25	Lab 8: Lasers;	
16	Th	Mar 18	Lasers	JF		Wed 3/17; Mon 3/22;	
17	Tu	Mar 23	Ionizing Radiation I	RC		Lab 9: Ionizing Radiation Instruments	
18	Th	Mar 25	Ionizing Radiation II	RC		Wed 3/24; Mon 3/29;	
19	Tu	Mar 30	RF/MW	JF	3 rd ed. Ch. 26	Wed 3/31; Mon 4/5; GEOL 13	
20	Th	Apr 1	Finish RF/MW	JF		Rachel Curry	
21	Tu	Apr 6	Finish ELF and NIR Control Program	JF	3 rd ed. Ch. 25	Lab 10: RF Microwave;	
22	Th	Apr 8	No class, attend Friday Classes			Wed 4/7 Mon 4/12;	
	Tu	Apr 13	THIRD HOUR EXAM (ionizing & nonionizing radiation)			Lab 11: Individual Field Lab work week, Report due Fri April 16th before 5PM.	
23	Th	Apr 15	Thermal Hazards (terms and physiology)	JF	3 rd ed. Ch. 27		
24	Tu	Apr 20	Thermal Stresses (adverse outcomes and physics)	JF	3 rd ed. Ch. 28	Lab 12: Heat stress Instruments;	
25	Th	Apr 22	Thermal Evaluation and Control	JF		Wed 4/21; Mon 4/26;	
26	Tu	Apr 27	Final Exam Review (Last day of classes)	JF			
	Th	Apr 29	Final Exam (comprehensive) – Thursday April 29th, 2021 from 9:30AM - 11:20PM				

Grading: 50% on the three one-hour exams, 35% on the final, and 15% on the laboratory exercises and lab reports
 Each exam is split into a closed book portion followed by an open book portion.
 Approximate grading scale: A: ≥90%, B: ≥78-90%, C: ≥65-78%, and D: ≥50-65, <50 will not pass.

After completing this course, the student should be able to:

1. Define terms used in noise; recall the physics of sound, the physiology of hearing and noise induced hearing loss, and acceptable noise exposure criteria; use noise measurement instruments; and apply noise abatement controls within a hearing conservation program.
2. Define terms used in vibration; recall the physics of vibration and its adverse health effects; and evaluate and control vibration.
3. Define terms used in thermal stresses; recall the physics of heat transfer; discuss the biological/health effects from heat and cold; employ thermal measurement instruments and interpret results; and apply elementary controls.
4. Define terms used in nonionizing radiation; recall the physics of nonionizing electromagnetic radiation; discuss the biological/health effects from ultraviolet, visible, infrared, and radio-frequency radiation, extremely low frequency electric and magnetic fields, and lasers; apply measurement fundamentals for nonionizing radiation; describe program requirements; and apply elementary controls.
5. Define terms used in ionizing radiation; describe the sources of, the physics behind, and biological consequences of exposure to the four major types of ionizing radiation; explain radiation detection instruments, dosimetry, and attenuation versus shielding; be able to use a radio nuclide's half-life to determine its activity; and recall the agencies that regulate ionizing radiation.

Lab Fee for this course is \$100.00. Lab fees used to maintain equipment and purchase new equipment when needed.