Theoretical and practical course plan form - Ilam University of Medical Sciences

Introducing sound lessons in the workplace in the second semester of 2020-2021

School: Health Department: Occupational Health Engineering and Occupational Safety

* Name and number of the course: Sound in the workplace

* Field and degree: Continuing bachelor's degree in the 4th semester of occupational health engineering and occupational safety

* Day and time: Saturday 12-10

* Venue: School of Health

* Name of the person in charge of the course (course instructor): Dr. Abbasi

* Prerequisite courses: Special physics 02 and 03

* Office address: School of Health - Department of Occupational Health

* Email address: am.abbasi@Yahoo.com

General Objective of the lesson: Recognizing audio sources and methods of production and propagation in the workplace and gaining the ability to measure and evaluate sound, familiarity with the principles of noise exposure control

• Behavioral goals (behavioral goals have an audience, behavioral verb, degree and criteria and conditions of performance)

At the end of the course the student will be able to:

1. Know the definitions, terms and basics of sound physics.

2. Familiar with the types and characteristics of mechanical waves and propagation environment.

3. Express the types of sound waves.

4. Know the physical and logarithmic quantities of sound.

5. Express the physical definition of the types of sound pressure.

6. Know the addition, subtraction and averaging of sound levels and their application

7. Know the range of hearing, hearing threshold, volume and volume level and their relationship with decibels

8. Know the application of PNC, NC and NR aligned curves.

9. Know the sources and conditions of sound propagation in closed and open environments

10. Know the application and how to use indicators such as Leq equivalent sound level, sound dose, SEL sound exposure level, perceived sound level and statistical level.

11. Familiarity with the effects of sound on the auditory system, physiological, cognitive and mental functions and performance of people in the face.

12. Know how sound works in conversation interference and speech clarity.

13. Be familiar with sound measuring devices and how to calibrate them.

14. Know the frequency weight networks and their application.

15. Be familiar with the objectives of sound surveillance in the workplace and the environment

16. Know the methods of measuring the sound of audio sources, individual and environmental exposure of sound

17. Know the short and long term sound dosimetry methods.

18. Know the standard methods of sound measurement in industry and office environments.

19. Know the permissible limits of occupational exposure to sound.

20. Know how to evaluate sound and prepare sound maps using software and reporting.

21. Know the acoustic evaluation of the work environment in terms of sound absorption and transmission properties.

22. Be familiar with the hearing protection program, including its objectives, components, training, monitoring, and control principles

23. Know the methods of evaluating the efficiency and effectiveness of the hearing protection program.

24. Be familiar with the principles of sound control at the source, in the direction and environment of the broadcast and the location of the listener.

25. Familiarity with the practical principles of sound control, including management control, structural control based on absorption and insulation, and sound defense.

26. Know the ethical aspects of measuring and evaluating sound in the workplace.

• Student duties (student homework during the semester)

Active student participation in class activities, problem solving and assignments, regular attendance in theory classes, reporting on practical and laboratory activities

• Main sources (observing the principles of source writing and giving an address for their preparation, including library, bookstore, internet, ...)

1. Sound and Vibration Engineering, Dr. Rostam Golmohammadi

2. Permitted Occupational Exposure Limits (OEL) of the Ministry of Health and Medical Education (latest edition)

3. Industrial Noise Control, Lewis Bell.

4. Managing noise and vibration at work, Last edition, South Tim.

5. Handbook of Acoustic Measurement and Control, Harris

6. ISO 9612 - ISO 1999

7. WHO, Occupational Exposure to Noise- Evaluation, Pervention and Control, World.

• Teaching methods and teaching aids used:

Teaching methods include: lectures, feedback lectures, conference questions and answers, group discussions, projects, problem solving - other methods ....

• Methods and time of assessment and evaluation of the student and the bar related to each assessment:

Method	Score	Date	Time
Questioning and answering students orally and performing activities requested of students	2	During the semester	During class hours
Midterm exam	8	Seventh session	12-10
Final exam (final)	10	Announced by Education	------

Lesson rules and expectations from students

1. Regular attendance in the classroom and active participation of students in class activities and solving assigned problems and assignments

2. Students' mobile devices are turned off in the classroom

Schedule of presenting the audio curriculum in the workplace of the second semester 2019-2020

Session	Time	Topic	Lecturer	Necessary preparation of students before the start of the class
1		Definitions, terms and principles of sound physics	Abbasi	
2		Definitions, terms and principles of sound physics		The student should read the contents of the previous sessions and study the topic of the lesson
3		Physical quantities (power, intensity and pressure) and logarithm of sound (power level, intensity level and pressure level) - volume, volume level, application of volume and its relation to decibels		The student should read the contents of the previous sessions and study the topic of the lesson
4		Sound propagation: from point sources, free field, linear sources, surface sources, direction factor, direction index, effect of reflection levels and representation on sound propagation from sources		The student should read the contents of the previous sessions and study the topic of the lesson
5		Sound propagation: from point sources, free field, linear sources, surface sources, direction factor, direction index, effect of reflection levels and representation on sound propagation from sources		The student should read the contents of the previous sessions and study the topic of the lesson
6		Outdoor sound propagation, effect of natural and artificial obstacles, ground effect, wind and ...		The student should read the contents of the previous sessions and study the topic of

				the lesson
7		Sound indicators: equivalent level, sound exposure level, circadian level, perceived sound level	Abbasi	The student should read the contents of the previous sessions and study the topic of the lesson
8		Midterm exam		The student should read the contents of the previous sessions 9and study the topic of the lesson
9		General hearing protection program, purpose of the program, program steps, ...	Abbasi	The student should read the contents of the previous sessions and study the topic of the lesson
10		Sound measuring and analyzing devices, calibration	Abbasi	The student should read the contents of the previous sessions and study the topic of the lesson
11		The purpose of sound study in the work environment, the method of measuring ambient and local noise and dosimetry	Abbasi	The student should read the contents of the previous sessions and study the topic of the lesson
12		Sound measurement and evaluation standards, standards for exposure to sound in industry, noise interference with conversation, masking coverage in non-industrial environments PNC, NC, NR curves	Abbasi	The student should read the contents of the previous sessions and study the topic of the lesson
13		How to evaluate sound and report writing - hearing protection devices and ... Familiarity with the general principles of sound control (in the source, in the transmission path and in the hearing	Abbasi	The student should read the contents of the previous sessions and study the topic of the lesson
14		Practical principles of sound control include managerial control, structural control based on absorption and insulation, and sound defense	Abbasi	The student should read the contents of the previous sessions and study the topic of the lesson
15		Ethical aspects in measuring and	Abbasi	The student should read the contents of

		evaluating sound in the workplace		the previous sessions and study the topic of the lesson
16		Solving problems	Abbasi	The student should read the contents of the previous sessions and study the topic of the lesson