KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Air Pollution and control Course Syllabus			
Course Title	Air pollution and control		
Course Code	NVE3315	**No. of Credits**	3
Department	Environmental Engineering Department	**College**	Engineering
Pre-requisites Course Code	NVE3320C	**Co-requisites Course Code**	
Course Coordinator(s)	Assistant Lecturer Ahmed. A Maaroof		
Email	Ahmed.abdulsalam@Komar.edu.iq	**Mob. No.**	142
Other Course Teacher(s)/Tutor(s)	None		
Class Hours	Every Sunday (12:00 – 13:30) - Room 209 / Section 1 Every Thursday (12:00 – 13:30) – Room 209 / Section 1		
Office Hours	Thursday (10:00 – 17:00) or by making an appointment via email (Email communication is highly encouraged) Office location is in the third floor-Room 508		
Course Type	Departmental Requirements		
Offer in Academic Year	Fall 2015		

COURSE DESCRIPTION

This course provides the fundamental knowledge of air pollution and the technologies for controlling the emissions. The course covers the following topics: air pollutants, environmental and health effects of air pollution, pollutant concentration and emission measurements, general techniques for controlling emissions, modern techniques for controlling air pollution, indoor air pollution, and finally Regional and global issues.

COURSE OBJECTIVES

Upon successful completion of this course, the students expected to:

- Learn the fundamental knowledge of air pollution source, primary and secondary air pollutants; as well as, their effects on environment and human health
- Learn the methods used to measure and estimate the emissions from stationary (e.g. factory) and mobile (e.g. cars) sources.
- Differentiate between the general and modern techniques used to control and reduce amount of gaseous emissions in the atmosphere.
- Learn the effective methods used to control particulate matter
- Understand the large scale issues and problems of air pollution.

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COURSE LEARNING OUTCOMES

After participating in the course, the students should be able to:

1. Define air pollution & list its sources. [K] ABET Program Outcome **a**, and **e**]
2. Interpret the effect of each pollutant on human health and the environment. [U] [ABET Program Outcome **a**, and **e**].
3. Detect & measure the extent of pollution in the atmosphere. [U] [ABET Program Outcome **a**, and **e**].
4. Apply & conclude the best and suitable technology for controlling any kind of gaseous & particulate matter emissions (e.g. Cyclone, Wet Scrubber and Electrostatic participator) depending on the properties of the medium. [A] [A] [ABET Program Outcome **e**].
5. Control hydrocarbon and VOC emissions through using the incineration or after burning techniques. [A] [ABET Program Outcome **a**].

GUIDELINES ON GRADING POLICY

A	95-100%	**C**	70-74%
A-	94-90%	**C-**	**65-69%**
B+	87-89%	**D+**	60-64%
B	83-86%	**D**	55-59%
B-	80-82%	**D-**	50-54%
C+	75-79%	**F**	0-49%
W	Withdrawal	**I**	Incomplete

Note: Passing Grade is 65% and above

COURSE CONTENT

Course topics include:

- Introduction and common air pollutants
- Health and environment impacts
- Air pollution measurements
- General ideas of air pollution control
- Gaseous emission control
- Particulate Control
- Indoor air quality
- Regional and Global Issues

COURSE TEACHING AND LEARNING ACTIVITIES

This course will be carried out in 3 hours, 2 times lecture per week. The semester has 15-instructional weeks followed by one week of exam. Course instructor will:

- Utilize power point presentation to present the course information.
- The board space to solve problems with students.
- There will be in class group work, where student will do in class exercises and turn the assignment to the instructor.

COURSE ASSESSMENT TOOLS

Assessment Tool	Description	Weight
Quizzes	Quizzes are scheduled as shown in the semester schedule	**10%**
Mid-term Exam	The mid-term exam will be conducted after week 7 of the semester. It will cover the first half of the course contents	**20%**
Test	The test will be conducted after week 12 of the semester. It will cover part of the second half of the course contents	**20%**
Assignment	Each student needs to work alone to search and write an essay on pollution prevention methods. Also, students' needs to make a short presentation for their submitted essay. The details of the essay and presentation will be announced during the semester.	**10%**
Field Trip	This include a field trip to a nearby factory in order to apply the theoretical knowledge that have been studied during this course. Also, the students require to submit a technical report for their visit. The details for the technical report will be discussed during the semester.	**10%**
Final Exam	The final exam will be designed to cover all the students' learning outcomes for this course, the exam will be closed book except the property tables that will be provided by the instructor	**30%**

Textbooks:

1. Vashi, D., Vashi, P. D., Shah, D. V., & Kurmi, K. B. Air pollution and its control measures.
2. Textbook. de Nevers, N., "Air Pollution Control Engineering" McGraw-Hill, Inc., 2000.

References:

1. Vallero, A. Fundamentals of air pollution Daniel A. [electronic resource] Amsterdam
2. Cooper, C.D. and Alley, F.C. Air pollution control: a design approach. Waveland Press, 2002

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

KUST Academic Policy

http://sar.komar.edu.iq/files/Student%20hand%20Book%202013.pdf

Attendance Policy:

Students are expected to attend each class for the entire semester. Students are responsible for material present in lectures. Only students with official KUST absence, family crises, and illness are excused from

class. Three occasions of lateness count as one absence. The student who misses 10 percent of the classes will be placed on probation.

Make up Policy:
Since all examination are announced in advance, ZERO grade will be given to any missed examination unless a student's has an acceptable reason, such as illness, for not being able to take the examination during all those days when the examination was announced.

Academic Dishonesty:
Any type of dishonesty (Plagiarism, Copying another's test or home-work, etc) will Not be tolerated. Students found guilty of any type of academic dishonesty are subject to failure in this course, plus further punishment by the University Council.

GUIDELINES FOR SUCCESS

1. Read and strive to understand (e.g. re-read, ponder) the materials assigned.
2. Illustrate interest and dedication to the course activities and deliverables.
3. Participate and respond to the instructor feedback sessions.
4. Strive to improve self-assessment, critical thinking and lifelong learning skills.
5. Complete course preparations and deliverables.
6. Be able to work independently and in a group.
7. Extend your knowledge beyond the given textbooks in order to master the subject, and
8. Try not to miss the classes.

Course calendar: Please check the academic calendar for fall 2015

Course Schedule

Week	Beg./End Dates	Topics (Chapters)	Assessment Tool
1	28 Sept – 1 Oct.	Introduction: • Air pollutants • Source of air pollutants	NA
2	4 – 8 Oct	Health and environmental effects of air pollution • Acid rain, Ozone depletion, Eutrophication and Haze • Effects on wildlife. • Crop and forest damage.	NA

3	11 – 15 Oct	Air pollution measurements and estimates • Types of measurements • The aim of sampling • Standard analytical methods	Quiz # 1
4	18 – 22 Oct	General ideas in air pollution control • Alternative energy source • Process Change • Change in Fuel • Good Operating Practices	N/A
5	25 – 29 Oct	Technology for gaseous air pollution Control: • SO_X CONTROL	Quiz # 2
6	1 – 5 Nov	Technology for gaseous air pollution Control: • NOx Control	N/A
7	8 – 12 Nov	Technology for gaseous air Pollution Control: • Carbon monoxide control • Carbon dioxide control	Quiz # 3
	16 – 21 Nov	Mid-Term exam	
8	22 – 26 Nov	Technology for particulate matter control: • Industrial sources of particulate matter • Effects of particulate matter • General method for controlling particulate matter	NA
9	29 Nov – 3 Dec	Cyclone: • Construction and operation • Advantageous and disadvantageous	Quiz # 4
10	6 – 10 Dec	Fabric filter: • Principles • Advantageous and disadvantageous	Quiz # 5
11	13 – 17 Dec	Electrostatic participator and wet scrubber: • Principles • Construction and operation	NA
12	20 – 24 Dec	Hydrocarbon and VOC Control: • Incineration or after burning • Principles • Operation	TEST

	27 – 31 Dec	**New year Holiday**	
13	3 – 7 Jan	Indoor air pollution • Hazards of indoor air pollution to children's health • Characteristics and issues relating to indoor air pollution in industrialized and developing countries • How to prevent exposure to indoor air contaminants	Assignment submission
14	10 – 14 Jan	Field Trip	Presentation
15	17 – 21 Jan	**REVIEW WEEK**	Technical report submission
16	24 – 31 Jan	**FINAL EXAMINATION**	