

Chemistry 205
Environmental Chemistry
Spring 2014

Instructors: Professor Stephen Dunham
Office: 214 Collier Hall of Science, 610-625-7103
Email: stephendunham@moravian.edu
&
Dr. Rebekah Brosky
Office: 230 Collier Hall of Science
Email: reb@moravian.edu

Lecture: M, T, W, F 8:55-9:45, 207 Collier

Lab: M 1.15-4.15, 211 Collier

Office Hrs: *Professor Dunham:* Posted each week on Blackboard, or by appointment.
Dr. Brosky: 9.45-11.15 M in office; 9.45-11.15 T and W virtual office hours (via Blackboard); other times by e-mail or oral appointment

Required Materials:

Text: Environmental Chemistry, 5th Edition by Colin Baird & Michael Cann (2012), W.H. Freeman.

Scientific Calculator: Must be able to calculate logs

Black Board Web Site: <http://blackboard.moravian.edu/>

You must enroll in the Chemistry 205 blackboard site.

- Throughout the semester, all handouts will be posted to the course blackboard page.

Lab Goggles: Safety glasses will be provided. They must be worn at all times in the laboratory! Gloves will be provided when necessary.

Old Clothes: We do not provide aprons so please wear old clothes at all times in the lab. Closed-toe shoes required.

Course Goals:

- Further develop principles, theories, and methods learned in General Chemistry to address chemical questions specific to the atmosphere, hydrosphere, and biosphere.
- Obtain hands on experience with instrumentation and analytical techniques
- Learn to critically review scientific studies of the environment
- Prepare and present an in-depth literature study on a specialized topic in Environmental Chemistry

Attendance: This course requires your participation! Moravian's policy on attendance is available at <http://www.moravian.edu/studentLife/handbook/academic/academic.html>. If you anticipate an unavoidable absence, please notify me ASAP before you are absent.

Academic Honesty: Please be familiar with the college policy on academic honesty <http://www.moravian.edu/studentLife/handbook/academic/academic2.html>. Because this course involves small group learning activities, each student is encouraged to exchange and share information with classmates. However, any work submitted in your name is to be your work alone.

Learning Differences: Students should contact the Office of Learning Services for disclosure of a learning difference and to request appropriate amendments to this course <http://www.moravian.edu/studentLife/handbook/academic/academic4.html>.

Grading: You are not in competition with anyone else in this class. Your grade will be determined only by the percentage of the total points you achieve. In the event that the class average on any graded activity falls below 75%, that score will be curved so that the class average is 75%.

Percentage Based Grading Scale

97-100	A !	83-86	B	70-72	C-
93-96	A	80-82	B-	67-69	D+
90-92	A-	77-79	C+	63-66	D
87-89	B+	73-76	C	60-62	D-
				< 60	F

There are a total of 1000 pts that will be factored into your final grade in this course. All points count the same amount.

Four Exams	450 pts
8-Quizzes	200 pts
10-Labs	250 pts
1-Presentation and paper	100 pts
Total	1000 pts

Exams: Three in-class (100 pts each) and one final (150 pts)

Exam 1	Wednesday, February 5
Exam 2	Wednesday, March 12
Exam 3	Wednesday, April 9
Final	Monday, April 28, 8:30 AM

Quizzes: These will be taken in class, likely each Wednesday (8 of 10 total, 25 pts each). The lowest score will be dropped at the end of the semester.

Laboratory: Each lab session will have a short write-up or presentation due at the *beginning of the following week's* lab period (10 of 12 total, 25 pts each). The lowest two scores will be dropped at the end of the semester.

Paper & Presentation: Each student will prepare a literature review paper (5-7 pages) and a (10-15 min) class presentation summarizing a recent peer-reviewed environmental publication. See: http://pubs.acs.org/journals/esthag/index_news.html for examples of recent environmental publications in *Environmental Science and Technology*.

Makeup Quizzes, Labs, and Exams: Missed labs will be counted as one of the “dropped” scores. You are responsible for understanding the content of the material covered during a missed lab. Makeup exams will be given at the discretion of the instructor for absences that have been documented by the Dean of Students Office and/or a health professional.

Class Etiquette:

- Turn off or silence cell phones! NO-text messaging during class
- Do not record or take pictures of classmates or instructors without their permission

Email Etiquette:

Although email may seem like an instantaneous form of communication, it is not. Just because you sent either one OR both of us an email, does not mean that we have

1) read it, 2) understood it, and/or 3) approved it.

- We will reply individually, or as a class response to all email received.
- Assume that email sent between the hours of 9 PM and 9AM has NOT been read

Pace of the Course: The schedule below is a guide for the course coverage this semester.

Week	Beginning	Anticipated Schedule	Quiz
Jan	13	CH 1,2 Stratospheric Chemistry and The Ozone Hole	
Jan	20	NO CLASS-MLK BIRTHDAY HOLIDAY	
Jan	21	CH 3 The Chemistry of the Troposphere	1
Jan	27	CH 4 Env. And Health: Conseq. Of Polluted Air	2
Feb	3	CH 5,6 The Greenhouse Effect, Fossil Fuels	
		Wednesday Feb 5, Exam I, CH 1-5	
Feb	10	CH 7,8 Renewable and Alternative Energies	3
Feb	17	CH 13 Pesticides	4
Feb	24	CH 14,15 Dioxins & Other Organics	5
Mar	3	SPRING BREAK	
Mar	10	CH 10 Chemistry of Natural Waters	
		Wednesday Mar 12, Exam II, CH 6-9,13-15	
Mar	17	CH 10 Chemistry of Natural Waters	6
Mar	24	CH 11 The Pollution and Purification of Water	7

Mar	31	CH 12 Toxic Heavy Metals	8
April	7	CH 16 Wastes, Soils and Sediments	
		<i>Wednesday, April 9, Exam 2, CH 13-14</i>	
April	14	CH 16 Wastes, Soils, and Sediments	9
April	21	Student Presentations	10
<i>April</i>	<i>28</i>	<i>Mon, April 28, 8:30 AM</i>	<i>Final, CH 12,16 and cumulative</i>

Lab Schedule

This is a basic outline of the lab exercises we will encounter each Monday. Details will be given in the weekly lab handouts. A reminder of what is due for the following lab session will be posted to blackboard each Monday after the lab session is finished.

Jan 13	Beer's Law activity; introduction to UV-VIS spectroscopy (Parts I and II)
Jan 20	NO LAB-MLK BIRTHDAY HOLIDAY
Jan 27	introduction to spectroscopy (Part III)
Feb 3	ozone generation; water ozonation and chlorination
Feb 10	determine ozone generation in the atmosphere
Feb 17	IR spectroscopy of gases
Feb 24	biofuels (Part I)
Mar 3	NO CLASS SPRING BREAK
Mar 10	biofuels (Part II)
Mar 17	propagation error; concentration of analyte by UV and fluorometry, including: serial dilution, calibration curves, LOD and standard addition
Mar 24	water analysis (Part I)
Mar 31	water analysis (Part II) including: using HACH kits to determine water properties
Apr 7	metal analysis (Part I) including: field sampling and acid digestion
Apr 14	metal analysis (Part II) including: AA of metals, standard addition
Apr 21	NO LAB