Natural Science I: Energy and the Environment

V55.0203 – Fall 2006

Prof. Henry C. Brenner
Department of Chemistry
Main 1001N
998-8432
henry.brenner@nyu.edu
Office Hour: Monday, 4 –5

I. Introduction

This course explores the scientific foundations of current environmental issues and their challenges for public policy. One goal of the course is to address directly many topics of crucial importance and current lively debate in our technology-based society, such as global warming, the quest for clean air and water, atmospheric ozone depletion, and the continuing search for viable sources of energy. A parallel aim is to impart a basic understanding of key chemical and physical concepts such as the structure of atoms and molecules, the interaction of light with matter, energy relationships in chemical reactions, and the properties of acids and bases. As you will see, these chemistry and physics concepts are introduced within the context of the discussion of the relevant environmental problems and will help you gain a fuller understanding of these problems. At the end of the course we hope that you will have attained an appreciation and hopefully an interest in the role of chemistry in our world, and that you will have acquired an intelligent and informed perspective with regard to environmental and energy-related issues.

II. Textbooks

There are two required texts for this course. The lecture text is Chemistry in Context: Applying Chemistry to Society (5th Edition), by Eubanks, Middlecamp, Pienta, Heltzel and Weaver (American Chemical Society, McGraw-Hill, 2006). Make sure you have the 5th edition, as it has been substantially revised from previous editions. There is also a Laboratory Manual. Both texts are available in the NYU Bookstore.

III. Lectures and Laboratories

The lectures are Tuesday and Thursday, 11:00 AM – 12:15 PM, in Room 207, Silver Center. A tentative lecture schedule appears later in this syllabus. All students in this course are required to register for one of the laboratory sections, which meet on Monday and Tuesday. You cannot receive credit for this course without taking the laboratory. Laboratories are held in room 455 Brown, and will begin on Monday, Sept. 18 (No labs Monday, Sept. 11 or Tuesday, Sept. 12).

IV. Communication

An NYU Blackboard page, which can be accessed through your home.nyu.edu page (click on "Academics"), will be set up shortly after the beginning of the semester. Check this page frequently for announcements and other course materials. You will receive information via your NYU e-mail address once it has been set up.

V. Attendance

Attendance will not be taken in lecture, but it is of course to your benefit to attend and find out what is going on in the course. Attendance is *required* in laboratory. There are no make-ups for the laboratory experiments or laboratory quizzes. If you miss a lab period because of illness you must present a doctor's note to your lab instructor explaining your absence. If you do not, you will receive a grade of zero for the laboratory work on that day. If you intend to miss a lab because of a religious holiday, you should inform your instructor in advance. In the case of excused absences, your grade for the laboratory will be based on the remaining laboratories that you did perform. However, if you miss four or more lab assignments for whatever reason, you will receive a grade of zero for the laboratory part of this course.

VI. Homework

Approximately ten homework problems will be assigned in lecture each week. They are to be handed in at the beginning of your laboratory period the following week. An unannounced selection of problems from the homework will be graded. Each homework assignment will be worth 10 points and late homework will be downgraded 3 points per day late. A list of homework problems is given at the end of this syllabus. Please note that even if you miss a laboratory session due to a documented absence (see V, above) you are still required to complete the homework assignment. Contact your laboratory instructor to arrange a suitable deadline for submitting the work.

VII. Teaching Assistants

The teaching assistants for this course are: Xiaoyu Dong (xd224@nyu.edu), Aiming Gao (ag746@nyu.edu) and Hongzhou Gu (hg499@nyu.edu). They are all experienced graduate students in the Department of Chemistry. They will lead you through your laboratory sessions and will also give occasional problem sessions (to be announced) and review sessions for the midterm and final examinations.

VIII. Basis of the Final Grade

The course will be graded on the basis of a single midterm (see schedule), a final, homework, lab quizzes, and laboratory work. The quizzes are given during the first ten minutes of the laboratory period, so be on time. The quizzes will be based on the procedure and basic theory for the laboratory assignment for that day, and are given to ensure that you read the assignment ahead of time and know what is to be done in lab on that day. The midterm and final examinations will be based on text, lecture and laboratory material. The percentage breakdown is as follows:

Midterm Examination	30%
Final Examination	30%
Homework	10%
Laboratory Work	30%

Each laboratory exercise is worth 50 points and the breakdown is as follows:

Attendance	10 points
Quiz	10 points
Lab Assignment	30 points

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Lecture and Laboratory Schedule

Date	Chapter	Title	Laboratory Assignments
Sept. 5		**Introduction**	
Sept. 7	1	**The Air We Breathe**	
Sept. 11/12			*No Lab*
Sept. 12	1		
Sept. 14	1		
Sept. 18/19			*Lab 1: Properties of Air*
Sept. 19	2	**Protecting the Ozone Layer**	
Sept. 21	2		
Sept. 25/26			*Lab 2: Properties of Light*
Sept. 26	2		
Sept. 28	3	**The Chemistry of Global Warming**	
Oct.2/3			*Lab 3: Suncreens*
Oct. 3	3		
Oct. 5	3		
Oct.9/10			*No lab: Columbus Day*
Oct. 10	3		
Oct. 12	4	**Energy, Chemistry and Society**	
Oct. 16/17			*Lab 4:Molecular Models*
Oct. 17	4		
Oct. 19	4		
Oct. 23/24			*Review for Midterm*
Oct. 24	5	**The Water We Drink**	
Oct. 26		***Midterm Examination***	
Oct. 30/ 31			*Lab 5: Heat of Reaction*
Oct. 31	5	**The Water We Drink** (cont.)	
Nov. 2	5		
Nov. 6/7			*Lab 6: Aqueous Ion Reactions*
Nov. 7	6	**Neutralizing the Threat of Acid Rain**	
Nov. 9	6		
Nov. 13/14			*Lab 7: Water Hardness*
Nov. 14	6		

Lecture and Laboratory Schedule (continued)

Nov. 16	8	**Energy from Electron Transfer**
Nov. 20/21		*Lab 8: Acid Rain*
Nov. 21	8	
Nov. 27/28		*Lab 9: Building Batteries*
Nov. 28	8	
Nov. 30	7	**The Fires of Nuclear Fission**
Dec. 4/5		*Lab 10: Photovoltaics*
Dec. 5	7	
Dec. 7	7	
Dec. 11/12		*Review for Final Exam*
Dec. 12		Review
Dec. 19		***Final Examination*** (10:00 – 11:50)

A list of representative homework problems is given below. The weekly assignments will most likely be drawn from this list, although supplementary problems may also be included.

Chapter	Homework
1	1, 6, 7, 9, 13, 15-19, 21, 36, 37
2	4, 7, 8, 10, 11, 13, 15-18, 21, 23, 32, 34, 43, 49
3	2, 4, 7, 9, 12-17, 18, 22-26, 28, 36, 40, 49
4	2, 4, 9, 12, 16, 17, 18, 21, 27, 51, 56
5	4, 6, 9, 13, 14, 15, 17, 19-25, 27, 29, 36
6	1, 3, 6, 9, 10, 11, 19, 20, 22, 25, 36, 37, 46, 49
8	1-3, 6, 7, 12, 16, 18, 24, 27, 29, 30, 34, 37, 38
7	4, 8, 10, 12, 13, 22, 24, 25, 27, 32, 33

All problems are from the text: Chemistry in Context: Applying Chemistry to Society, 5th Edition, by Eubanks, Middlecamp, Pienta, Heltzel and Weaver (American Chemical Society, McGraw-Hill, 2006)

Academic Guidelines for Students
Morse Academic Plan, College of Arts and Science

To help foster common academic expectations among students and instructors, the following guidelines for MAP courses are offered to students. While these represent minimum expectations across the curriculum, individual faculty members may set additional course requirements. Students should therefore consult the course syllabus for details of policies in each class.

Attendance
Inasmuch as students have voluntarily sought admission to the University, they are expected to attend all class meetings, including all lectures and all meetings of associated recitation, workshop, or laboratory sections. Students may be excused for documented medical or personal emergency and will receive reasonable accommodation for the observance of religious holidays. In these cases, they should contact their instructors in advance or, in cases of emergency, as soon as is practicable. Students are responsible for making up any material or assignments they miss.

Classroom Decorum
The classroom is a space for free and open inquiry and for the critical evaluation of ideas, and it should be free of personal prejudice. Students and instructors alike have an obligation to all members of the class to create an educational atmosphere of mutual trust and respect in which differences of opinion can be subjected to deliberate and reasonable examination without animus.

As a matter of courtesy to their fellow students and instructors, students should arrive at class promptly, prepared and ready to participate. Students are reminded particularly to shut off all cellular telephones and pagers and, except in cases of emergency, to remain in the classroom for the duration of the lecture or section meeting. If it is necessary to leave or enter a room once class has begun, students should do so quietly and with as little disruption as possible. Under University policy, disruptive classroom behavior may be subject to faculty review and disciplinary sanction.

Completion of Assignments
Students are expected to submit course work on time and to retain copies of their work until a final grade has been received for the course. Instructors are not obliged to accept late work and may assign a failing or reduced grade to such assignments.

Students who encounter sudden and incapacitating illness or an other comparably grave circumstance that prevents them from completing the final examination or assignment in a course may request a temporary mark of Incomplete from the course instructor. To receive an Incomplete, students must have completed all other requirements for the course, including satisfactory attendance, and there must be a strong likelihood they will pass the course when all work is completed.

Questions and Concerns
Up-to-date course information is available on the MAP website: www.nyu.edu/cas/map. Questions, concerns, comments, and feedback may be directed to the following members of the MAP staff, located in 903 Silver Center, 212-998-8119. Complaints will remain confidential.

Director:	Dr. Eliot Borenstein	morse.plan@nyu.edu
Associate Director, FCC:	Dr. Vincent Renzi	map.fcc@nyu.edu
Associate Director, FSI:	Dr. Trace Jordan	map.fsi@nyu.edu
Director of Administration:	Mike Summers	morse.plan@nyu.edu

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Statement on Academic Integrity
Morse Academic Plan, College of Arts and Science

As a student at New York University, you have been admitted to a community of scholars who value free and open inquiry. Our work depends on honest assessment of ideas and their sources; and we expect you, as a member of our community, likewise to maintain the highest integrity in your academic work. Because of the central importance of these values to our intellectual life together, those who fail to maintain them will be subject to severe sanction, which may include dismissal from the University.

Plagiarism consists in presenting ideas and words without acknowledging their source and is an offense against academic integrity. Any of the following acts constitutes a crime of plagiarism.

- Using a phrase, sentence, or passage from another person's work without quotation marks and attribution of the source.
- Paraphrasing words or ideas from another's work without attribution.
- Reporting as your own research or knowledge any data or facts gathered or reported by another person.
- Submitting in your own name papers or reports completed by another.
- Submitting your own original work toward requirements in more than one class without the prior permission of the instructors.

Other offenses against academic integrity include the following.

- Collaborating with other students on assignments without the express permission of the instructor.
- Giving your work to another student to submit as his or her own.
- Copying answers from other students during examinations.
- Using notes or other sources to answer exam questions without the instructor's permission.
- Secreting or destroying library or reference materials.
- Submitting as your own work a paper or results of research that you have purchased from a commercial firm or another person.

Particular emphasis is placed on the use of papers and other materials to be found on the World-Wide Web, whether purchased or freely available. In addition to having access to the same search engines as students, faculty also have at their disposal a number of special websites devoted to detecting plagiarism from the web.

Plagiarism and other cases of academic fraud are matters of fact, not intention. It is therefore crucial that you be diligent in assuring the integrity of your work.

- Use quotation marks to set off words that are not your own.
- Learn to use proper forms of attribution for source materials.
- Do your own original work in each class, without collaboration, unless otherwise instructed.
- Don't use published sources, the work of others, or material from the web without attribution.
- For further information, consult the Bulletin of the College of Arts and Science, the CAS Academic Handbook, and the Student's Guide to NYU.

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