

**CHM 1070**  
**Chemistry of Our World: Energy and the Environment**  
**Course Syllabus**

I. Wright State University, College of Science and Mathematics  
Department of Chemistry

II. Course Information

Course Title: **Chemistry of Our World: Energy and the Environment**

Course Abbreviation and Number: **CHM 1070**

Course Credit Hours; **3**

Course Cross Listing(s) Abbreviation and Number:

Check ("x") all applicable:

General Education Course   **Element 6**   Writing Intensive Course   **X**   Service Learning Course       

Laboratory Course   **X**   Ohio TAG (Transfer Assurance Guide) Course   **X**  

Ohio Transfer Module Course   **X**   Others (specify)       

III. Course Registration

Prerequisites:

Corequisites: CHM 1070L

Restrictions:

Other:

IV. Student Learning Outcomes

Our use of energy causes most of our environmental woes, whether from mining fuels, from processing of fuels, or our use of fuels. Energy and Our Environment will examine the consequences of our selected energy sources through the lens of chemistry with ties to geology, biology, nuclear physics, environmental policy, and ethics. Required written laboratory reports will improve the student's ability to communicate technical matter more effectively and encourage thoughtful analysis. In the discussion of alternative energies and fossil fuels, students will evaluate the consequences of various energy choices based on scientific evidence rather than on misconceptions and old beliefs. Students will also participate in conservation activities.

COURSE OBJECTIVES are for the student to be able to:

Tell how we use our major sources of energy (coal, petroleum, and nuclear)

Compare the environmental impacts from our uses of various forms of energy

Name major air pollutants and their causes and effects

List the major water pollutants and their causes and effects

Discuss hazards and risks of chemicals in our society

Describe alternative fuels, their use and development

CHM 1070 is a Natural Science course for the Core Element program. Learning outcomes are:

Understand the nature of scientific inquiry

Critically apply knowledge of scientific theory and methods of inquiry to evaluate information from a variety of sources

Distinguish between science and technology and recognize their roles in society

Demonstrate an awareness of theoretical, practical, creative and cultural dimensions of scientific inquiry

Discuss fundamental theories underlying modern science

CHM 1070 is an integrated writing course. Students will be expected to produce writing that

- Demonstrates their understanding of course content,
- Is appropriate for the audience and purpose of a particular writing task,
- Demonstrates the degree of mastery of disciplinary writing conventions appropriate to the course (including documentation conventions), and
- Shows competency in standard edited American English.

#### V. Course Materials

*Fundamentals of Sustainable Chemical Science*, 1<sup>st</sup> Ed., S.E. Manahan, CRC Press  
 D. A. Grossie & K. Underwood, *Laboratory Guide for Chemistry*, 5<sup>th</sup> Ed., Hayden McNeil, 2010.

#### VI. Method of Instruction

Lecture, Experimentation and Community Action

#### VII. Evaluation and Policy

Written exams, quizzes (5 at 50 points each)	200 points
(The lowest exam grade will be dropped, no make-up exams)	
Homework assignments (10 at 20 points each)	200 points
Final exam	100 points
Conservation Points	100 points
Laboratory projects (8 at 25 points each)	200 points
	TOTAL 800 points

#### VIII. Grading Policy

It is expected that grades will be assigned according to the following performance levels.

>90% = A      80-89% = B      70-79% = C      60-69% = D      <60% = F

#### IX. Suggested Assignments and Course Outline

	<b>Lecture</b>	<b>Laboratory</b>
Week 1	Fossil fuel chemistry	Laboratory report writing
Week 2	Oil processing and use	Heating value of fuels
Week 3	Coal mining and use	Oxygen content of air
Week 4	Using natural gas	Report revision lab
Week 5	Nuclear chemistry	Flame and fireworks
Week 6	Nuclear energy	Radioactivity
Week 7	Radioactive wastes	Report revision lab
Week 8	Atmospheric chemistry	Particulate matter in air I
Week 9	Air pollutants and their effects	Particulate matter in air II
Week 10	Measuring and preventing air pollution	Report revision lab
Week 11	Energy sustainability	Electrolysis
Week 12	Alternative energy sources	Water quality assessment I
Week 13	Water resources and pollution	Water quality assessment II
Week 14	Agricultural chemicals and toxicology	Waste treatment
Week 15	Final Exam	

#### X. Other Information

Students by submitting full laboratory reports of approximately 3 – 5 pages. Laboratory reports are required to emphasize the importance of written communication in science. All reports will contain the following sections:

Title Page  
 Introduction  
 Experimental Section

Results and Discussion  
References

Students will receive weekly feedback on their writing through graded lab reports, so as to improve their writing skills.

The conservation points and activities referred to above will be accomplished by students who will be given points for self-reported and documented "Acts of Conservation" such as recycling, picking up litter, car pooling, reducing electricity usage, reducing water usage, etc.

Approved:  
Undergraduate Curriculum and Academic Policy Committee \_\_\_\_\_  
Faculty Senate \_\_\_\_\_