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, 1st Ed.*, S.E. Manahan, CRC Press

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

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

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

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