From the Industrial Revolution to Green Chemistry

MWF 9:00–9:50 am, Chem 251

Purpose
This introductory, college-level course meets the liberal education requirement for “Sustainability”. The Industrial Revolution has had a significant impact on people’s income, quality of life, environment, and society in the western great lakes region. We will examine the scientific and technological advances associated with this period with a particular emphasis on the chemical basis for these advances. We will learn about the contributions of some 18th and 19th century chemists with a particular focus on individuals whose work furthered the Industrial Revolution and/or had a connection to the western great lakes region. We will also study the impact of the Industrial Revolution on society including the production of pollution and green house gases. At the end of the course, we will look at some “green chemistry” solutions to these problems.

Prerequisites
None.
Prior courses in chemistry are helpful, but not required for this course.

Course Instructor

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Office</th>
<th>Phone</th>
<th>Email</th>
<th>Office Hours</th>
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</thead>
<tbody>
<tr>
<td>Romesh Lakhan</td>
<td>Chem 233</td>
<td>726–7773</td>
<td><a href="mailto:Lakh0012@d.umn.edu">Lakh0012@d.umn.edu</a></td>
<td>10-11am M, 10-12pm W</td>
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Course Goals
Students will:

1. Increase their knowledge of chemistry in the context of the Industrial Revolution including the lives of selected 18th and 19th century scientists and contemporary “green chemistry” advances.
2. Improve critical thinking, analytical, and problem solving skills.
3. Strengthen written and oral communication skills.
4. Seek and use published resources (printed and on-line) related to the course topics.
5. Develop an appreciation for the relevance of chemistry in our daily lives.

Grade Distribution

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Component</th>
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<tbody>
<tr>
<td>20%</td>
<td>Attendance and Discussion</td>
</tr>
<tr>
<td>30%</td>
<td>In-class exams (2) Tentative dates: Wednesday, February 19th and Friday, March 14th</td>
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<tr>
<td>10%</td>
<td>Green Chemistry Oral Presentations</td>
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<tr>
<td>20%</td>
<td>Term Paper</td>
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<tr>
<td>20%</td>
<td>Final Exam</td>
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<td>100%</td>
<td>Total</td>
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Tentative Course Topics and Grading

<table>
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<tr>
<th>Date</th>
<th>Topic</th>
<th>Grade Range</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>1/22</td>
<td>Syllabus, Introduction</td>
<td>A/A-</td>
<td>90+</td>
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<tr>
<td>1/31</td>
<td>Steam Power</td>
<td>B+/B/B-</td>
<td>80–89</td>
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<tr>
<td>2/10</td>
<td>Mining</td>
<td>C+/C/C-</td>
<td>70–79</td>
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<tr>
<td>2/21</td>
<td>Steel</td>
<td>D+/D</td>
<td>60–69</td>
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<tr>
<td>3/3</td>
<td>Forestry</td>
<td></td>
<td>&lt;60</td>
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<tr>
<td>2/21</td>
<td>Energy Production</td>
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<tr>
<td>3/17</td>
<td>Spring Break</td>
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<tr>
<td>3/24</td>
<td>Green Energy</td>
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<tr>
<td>4/2</td>
<td>Environmental and Societal Impact of Industrial Revolution Green Chemistry</td>
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<tr>
<td>4/7</td>
<td>Environmental and Societal Impact of Industrial Revolution Green Chemistry</td>
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<tr>
<td>4/14</td>
<td>Labor Movement</td>
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<td>4/22</td>
<td>Green Chemistry</td>
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<td>4/30</td>
<td>Oral Presentations</td>
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<tr>
<td>5/5</td>
<td>Oral Presentations</td>
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Make-up Exams
Students are required to discuss arrangements for make-up exams prior to the scheduled exam date. If you should become ill or have an emergency that prevents you from taking an exam, leave a voice mail message for the course instructor (726-7773) or contact your instructor by email (lakh0012@d.umn.edu) before the scheduled exam time.

No Extra Credit.

Additional Course Information
1. Late homework will not be accepted. In addition to the class Moodle site, I will communicate with you by email. Be sure to check your email and the course website regularly. Homework, quiz, and test scores will only be posted on eGradebook.
2. Students who have concerns about the lecture or other course-related issues should discuss them the course instructor. Issues that remain unresolved should be discussed with the department head, Dr. Bilin Tsai.

Liberal Education Goals and Objectives
This course is a liberal education course that fulfills the requirement for sustainability and as such includes topics basic to the understanding of the physical world, applications of these topics in society and an historical
development of the laws and theories of physical science. Problem solving and analytical thinking skills are stressed in the lecture and out of classroom components of the course.

**Resources for Students with Disabilities:** Individuals who have any disability or physical condition (such as pregnancy or allergy), which might affect their ability to perform in this course are encouraged to inform the instructor at the start of the semester. Adaptation of the methods, materials, or testing may be made as required for equitable participation. Students with disabilities are encouraged to contact the Office of Disability Resources to discuss and arrange reasonable accommodations. Please call 218-726-6130 or visit the [Disability Resources website](http://www.umn.edu) for more information.

**Student Academic Integrity Policy:** Academic dishonesty tarnishes UMD's reputation and discredits the accomplishments of students. UMD is committed to providing students every possible opportunity to grow in mind and spirit. This pledge can only be redeemed in an environment of trust, honesty and fairness. As a result all members of the academic community regard academic dishonesty as a serious offense. In keeping with this ideal, this course will adhere to [UMD's Student Academic Integrity Policy](http://www.umn.edu). This policy sanctions students engaging in academic dishonesty with penalties up to and including expulsion from the university for repeat offenders.

**University Student Conduct Code:** Disruptive classroom behavior that substantially or repeatedly interrupts either the instructor’s ability to teach, or student learning is prohibited. Disruptive behavior includes inappropriate use of technology in the classroom. Examples include ringing cell phones, text-messaging, watching videos, playing computer games, doing email, or surfing the Internet on your computer, instead of note-taking or other instructor-sanctioned activities. This code will be enforced and can be found at: [www.d.umn.edu/conduct/](http://www.d.umn.edu/conduct/).