

## CUNY Common Core Course Submission Form

Instructions: All courses submitted for the Common Core must be liberal arts courses. Courses submitted to the Course Review Committee may be submitted for only one area of the Common Core and must be 3 credits. Colleges may submit courses to the Course Review Committee before or after they receive college approval. STEM waiver courses do not need to be approved by the Course Review Committee. This form should not be used for STEM waiver courses.

<b>College</b>	Kingsborough Community College	
<b>Course Prefix and Number (e.g., ANTH 101, if number not assigned, enter XXX)</b>	CHM 200	
<b>Course Title</b>	Introduction to Green Chemistry	
<b>Department(s)</b>	Physical Sciences Department	
<b>Discipline</b>	General Science – Chemistry	
<b>Credits</b>	3 credits	
<b>Contact Hours</b>	3 hours (lecture, laboratory & recitation)	
<b>Pre-requisites (if none, enter N/A)</b>	Passing Scores on the CUNY Reading and Writing exams.	
<b>Co-requisites (if none, enter N/A)</b>	MAT 900	
<b>Catalogue Description</b>	This introductory course covers the basics in chemistry within the context of “green” principles and their applications. Laboratory modules explore relevant topics such as alternative energy, renewable resources, and environmental chemistry. Fulfills the CHM11 prerequisite.	
<b>Special Features (e.g., linked courses)</b>		
<b>Sample Syllabus</b>	Syllabus must be included with submission, 5 pages max recommended	
<b>Indicate the status of this course being nominated:</b>		
<input checked="" type="checkbox"/> current course <input type="checkbox"/> revision of current course <input type="checkbox"/> a new course being proposed		
<b>CUNY COMMON CORE Location</b>		
<b>Please check below the area of the Common Core for which the course is being submitted. (Select only one.)</b>		
<b>Required</b> English Composition Mathematical and Quantitative Reasoning <input checked="" type="checkbox"/> Life and Physical Sciences	<b>Flexible</b> World Cultures and Global Issues US Experience in its Diversity Creative Expression	Individual and Society <input checked="" type="checkbox"/> Scientific World

Dear Sirs,

I am writing to you regarding the matter of the...

The information provided to me indicates that...

I am sure that you will find this information...

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## Learning Outcomes

In the left column explain the course assignments and activities that will address the learning outcomes in the right column.

### I. Required Core (12 credits)

#### A. English Composition: Six credits

A course in this area must meet all the learning outcomes in the right column. A student will:

	<ul style="list-style-type: none"> <li>• Read and listen critically and analytically, including identifying an argument's major assumptions and assertions and evaluating its supporting evidence.</li> </ul>
	<ul style="list-style-type: none"> <li>• Write clearly and coherently in varied, academic formats (such as formal essays, research papers, and reports) using standard English and appropriate technology to critique and improve one's own and others' texts.</li> </ul>
	<ul style="list-style-type: none"> <li>• Demonstrate research skills using appropriate technology, including gathering, evaluating, and synthesizing primary and secondary sources.</li> </ul>
	<ul style="list-style-type: none"> <li>• Support a thesis with well-reasoned arguments, and communicate persuasively across a variety of contexts, purposes, audiences, and media.</li> </ul>
	<ul style="list-style-type: none"> <li>• Formulate original ideas and relate them to the ideas of others by employing the conventions of ethical attribution and citation.</li> </ul>

#### B. Mathematical and Quantitative Reasoning: Three credits

A course in this area must meet all the learning outcomes in the right column. A student will:

	<ul style="list-style-type: none"> <li>• Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.</li> </ul>
	<ul style="list-style-type: none"> <li>• Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.</li> </ul>
	<ul style="list-style-type: none"> <li>• Represent quantitative problems expressed in natural language in a suitable mathematical format.</li> </ul>
	<ul style="list-style-type: none"> <li>• Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.</li> </ul>
	<ul style="list-style-type: none"> <li>• Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.</li> </ul>
	<ul style="list-style-type: none"> <li>• Apply mathematical methods to problems in other fields of study.</li> </ul>

**C. Life and Physical Sciences: Three credits**

A course in this area must meet all the learning outcomes in the right column. A student will:

<p>Students will understand the basic principles of chemistry within the context of "green" principles and their applications. Students will learn the basic principles of chemistry such as the modern atomic theory, law of multiple proportions, and law of conservation of mass. Student will explore relevant topics such as alternative energy, renewable resources, and environmental chemistry.</p>	<ul style="list-style-type: none"><li>• Identify and apply the fundamental concepts and methods of a life or physical science.</li></ul>
<p>Students will apply the scientific method to explore the basics in chemistry within the context of "green" principles and their applications. Using the information they have gathered during lecture discussions, students will interpret and assess the information and will engage in group investigations concerning the increasing involvement of scientists in environmental stewardship. Students will also analyze changes due to increasing technological and scientific developments in alternative energy, renewable resources, and environmental chemistry. Students will present their findings during lecture and laboratories presenting oral arguments for or against a particular opinion in terms of basic principles of chemistry. Students will also present their findings in writing both formally and informally in the form of a research paper and in class essays.</p>	<ul style="list-style-type: none"><li>• Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.</li></ul>
<p>Students will apply the basic techniques of the physical and chemical sciences collaboratively in laboratory to further their understanding of green chemistry. Students will conduct experiments in: Measurement and Density, Chemical Reactions, Empirical Formula, Titration, Atomic Spectroscopy, and Mass Percent Composition.</p>	<ul style="list-style-type: none"><li>• Use the tools of a scientific discipline to carry out collaborative laboratory investigations.</li></ul>
<p>Students will gather, analyze, and interpret data from their laboratory experiments. Students will be able present their findings and well reasoned conclusions in laboratory reports.</p>	<ul style="list-style-type: none"><li>• Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.</li></ul>
<p>Students will accumulate information from scientific publications and public media including data, reports, opinions, and policies regarding alternative energy, renewable resources, and environmental chemistry. In class discussion will stress ethical issues and unbiased conclusions from presented data in terms of basic chemistry principles. Controversial environmental chemistry issues and common misconceptions will be addressed within the scientific framework of basic principles of chemistry. Students will present their findings in writing both formally and informally in the form of a research paper and in class essays.</p>	<ul style="list-style-type: none"><li>• Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.</li></ul>

**II. Flexible Core (18 credits)**

Six three-credit liberal arts and sciences courses, with at least one course from each of the following five areas and no more than two courses in any discipline or interdisciplinary field.

**A. World Cultures and Global Issues**

A Flexible Core course must meet the three learning outcomes in the right column.

	<ul style="list-style-type: none"><li>• Gather, interpret, and assess information from a variety of sources and points of view.</li></ul>
	<ul style="list-style-type: none"><li>• Evaluate evidence and arguments critically or analytically.</li></ul>
	<ul style="list-style-type: none"><li>• Produce well-reasoned written or oral arguments using evidence to support conclusions.</li></ul>

A course in this area (II.A) must meet at least three of the additional learning outcomes in the right column. A student will:

	<ul style="list-style-type: none"><li>• Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring world cultures or global issues, including, but not limited to, anthropology, communications, cultural studies, economics, ethnic studies, foreign languages (building upon previous language acquisition), geography, history, political science, sociology, and world literature.</li></ul>
	<ul style="list-style-type: none"><li>• Analyze culture, globalization, or global cultural diversity, and describe an event or process from more than one point of view.</li></ul>
	<ul style="list-style-type: none"><li>• Analyze the historical development of one or more non-U.S. societies.</li></ul>
	<ul style="list-style-type: none"><li>• Analyze the significance of one or more major movements that have shaped the world's societies.</li></ul>
	<ul style="list-style-type: none"><li>• Analyze and discuss the role that race, ethnicity, class, gender, language, sexual orientation, belief, or other forms of social differentiation play in world cultures or societies.</li></ul>
	<ul style="list-style-type: none"><li>• Speak, read, and write a language other than English, and use that language to respond to cultures other than one's own.</li></ul>

**B. U.S. Experience in its Diversity**

A Flexible Core course must meet the three learning outcomes in the right column.

	<ul style="list-style-type: none"><li>• Gather, interpret, and assess information from a variety of sources and points of view.</li></ul>
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	<ul style="list-style-type: none"> <li>Evaluate evidence and arguments critically or analytically.</li> </ul>
	<ul style="list-style-type: none"> <li>Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>
<p>A course in this area (II.B) <u>must meet at least three of the additional learning outcomes</u> in the right column. A student will:</p>	
	<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the U.S. experience in its diversity, including, but not limited to, anthropology, communications, cultural studies, economics, history, political science, psychology, public affairs, sociology, and U.S. literature.</li> </ul>
	<ul style="list-style-type: none"> <li>Analyze and explain one or more major themes of U.S. history from more than one informed perspective.</li> </ul>
	<ul style="list-style-type: none"> <li>Evaluate how indigenous populations, slavery, or immigration have shaped the development of the United States.</li> </ul>
	<ul style="list-style-type: none"> <li>Explain and evaluate the role of the United States in international relations.</li> </ul>
	<ul style="list-style-type: none"> <li>Identify and differentiate among the legislative, judicial, and executive branches of government and analyze their influence on the development of U.S. democracy.</li> </ul>
	<ul style="list-style-type: none"> <li>Analyze and discuss common institutions or patterns of life in contemporary U.S. society and how they influence, or are influenced by, race, ethnicity, class, gender, sexual orientation, belief, or other forms of social differentiation.</li> </ul>
<p><b>C. Creative Expression</b></p>	
<p>A Flexible Core course <u>must meet the three learning outcomes</u> in the right column.</p>	
	<ul style="list-style-type: none"> <li>Gather, interpret, and assess information from a variety of sources and points of view.</li> </ul>
	<ul style="list-style-type: none"> <li>Evaluate evidence and arguments critically or analytically.</li> </ul>
	<ul style="list-style-type: none"> <li>Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>
<p>A course in this area (II.C) <u>must meet at least three of the additional learning outcomes</u> in the right column. A student will:</p>	
	<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring creative expression, including, but not limited to, arts, communications, creative writing, media arts, music, and theater.</li> </ul>
	<ul style="list-style-type: none"> <li>Analyze how arts from diverse cultures of the past serve as a foundation for those of the present, and describe the significance of works of art in the societies that created them.</li> </ul>

	<ul style="list-style-type: none"> <li>• Articulate how meaning is created in the arts or communications and how experience is interpreted and conveyed.</li> </ul>
	<ul style="list-style-type: none"> <li>• Demonstrate knowledge of the skills involved in the creative process.</li> </ul>
	<ul style="list-style-type: none"> <li>• Use appropriate technologies to conduct research and to communicate.</li> </ul>

**D. Individual and Society**

A Flexible Core course must meet the three learning outcomes in the right column.

	<ul style="list-style-type: none"> <li>• Gather, interpret, and assess information from a variety of sources and points of view.</li> </ul>
	<ul style="list-style-type: none"> <li>• Evaluate evidence and arguments critically or analytically.</li> </ul>
	<ul style="list-style-type: none"> <li>• Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>

A course in this area (II.D) must meet at least three of the additional learning outcomes in the right column. A student will:

	<ul style="list-style-type: none"> <li>• Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the relationship between the individual and society, including, but not limited to, anthropology, communications, cultural studies, history, journalism, philosophy, political science, psychology, public affairs, religion, and sociology.</li> </ul>
	<ul style="list-style-type: none"> <li>• Examine how an individual's place in society affects experiences, values, or choices.</li> </ul>
	<ul style="list-style-type: none"> <li>• Articulate and assess ethical views and their underlying premises.</li> </ul>
	<ul style="list-style-type: none"> <li>• Articulate ethical uses of data and other information resources to respond to problems and questions.</li> </ul>
	<ul style="list-style-type: none"> <li>• Identify and engage with local, national, or global trends or ideologies, and analyze their impact on individual or collective decision-making.</li> </ul>

**E. Scientific World**

A Flexible Core course must meet the three learning outcomes in the right column.

<p>Students will accumulate information from scientific publications and public media including data, reports, opinions, and policies regarding alternative energy, renewable resources, and environmental chemistry. Controversial environmental chemistry issues and common misconceptions will be addressed within the scientific framework of basic principles of chemistry.</p>	<ul style="list-style-type: none"> <li>Gather, interpret, and assess information from a variety of sources and points of view.</li> </ul>
<p>Using the information they have gathered during lecture discussions, students will interpret and assess the information and will engage in group investigations concerning the relationship between "green" chemistry and the environment. Students will analyze changes due to increasing technological and scientific developments in alternative energy, renewable resources, and environmental chemistry in terms of basic principles of chemistry. In class discussion will stress ethical issues and unbiased conclusions from presented data in terms of basic chemistry principles.</p>	<ul style="list-style-type: none"> <li>Evaluate evidence and arguments critically or analytically.</li> </ul>
<p>Students will present their findings during lecture presenting oral arguments for or against a particular opinion in terms of basic principles of chemistry. Students will also present their findings in writing both formally and informally in the form of a research paper and in class essays.</p>	<ul style="list-style-type: none"> <li>Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>
<p>A course in this area (II.E) <u>must meet at least three of the additional learning outcomes</u> in the right column. A student will:</p>	
<p>Students will understand the basic principles of chemistry within the context of "green" principles and their applications. Students will learn the basic principles of chemistry such as the modern atomic theory, law of multiple proportions, and law of conservation of mass. Student will explore relevant topics such as alternative energy, renewable resources, and environmental chemistry.</p>	<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the scientific world, including, but not limited to: computer science, history of science, life and physical sciences, linguistics, logic, mathematics, psychology, statistics, and technology-related studies.</li> </ul>
<p>Students will apply the basic techniques of the physical and chemical sciences in laboratory to further their understanding of chemistry. Students will demonstrate how tools of science, technology, or formal analysis can be used to analyze problems and develop solutions. Students will conduct experiments in: Measurement and Density, Chemical Reactions, Empirical Formula, Titration, Atomic Spectroscopy, and Mass Percent Composition.</p>	<ul style="list-style-type: none"> <li>Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions.</li> </ul>
<p>Students will learn how to use the periodic table to determine and name the types of compounds that can be formed, write and balance chemical reactions, perform stoichiometry calculations, collect and plot data to examine a chemical principle, and formulate and test hypotheses based on a laboratory exercise.</p>	<ul style="list-style-type: none"> <li>Articulate and evaluate the empirical evidence supporting a scientific or formal theory.</li> </ul>
<p>Student will be able relate the basics in chemistry within the context of "green" principles. Student will understand the increasing involvement of scientists in environmental stewardship. Students will analyze changes due to increasing technological and scientific developments in alternative energy, renewable resources, and environmental chemistry. In class discussion will stress ethical issues and unbiased conclusions from presented data in terms of basic chemistry.</p>	<ul style="list-style-type: none"> <li>Articulate and evaluate the impact of technologies and scientific discoveries on the contemporary world, such as issues of personal privacy, security, or ethical responsibilities.</li> </ul>
<p>Student will develop further their ability to gather, interpret, and assess information from a variety of sources and points of view, to think critically about and evaluate the impact of technology and science and to communicate their well-reasoned thoughts both in oral and written form. Students will address changes due to increasing technological and scientific developments in alternative energy, renewable resources, and environmental chemistry within the scientific framework of basic principles of chemistry.</p>	<ul style="list-style-type: none"> <li>Understand the scientific principles underlying matters of policy or public concern in which science plays a role.</li> </ul>





