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.

College	Kingsborough Community College
Course Prefix and Number (e.g., ANTH 101, if number not assigned, enter XXX)	SCI 5100
Course Title	Physical Sciences and the Environment
Department(s)	Physical Sciences Department
Discipline	General Science – Chemistry and Physics
Credits	II. Flexible Core (18 credits) & E. Scientific World
Contact Hours	3 credits
Pre-requisites (if none, enter N/A)	5 hours (3 hours lecture and 2 hours laboratory per week)
Co-requisites (if none, enter N/A)	Passing Scores on the CUNY Reading and Writing exams.
Catalogue Description	SCI 5100 – PHYSICAL SCIENCES AND THE ENVIRONMENT (WITH LABORATORY) (3 crs. 5 hrs.) An investigation of important topics that involve the state of the environment from a scientific perspective. This course will cover topics that include global warming, stratospheric ozone depletion, acid rain, the carbon and nitrogen cycles, chemical and industrial pollution, the impact of fossil fuels, nuclear energy, and treatment. The gathering, analysis, interpretation, and presentation of scientific data. The measure of selected physical, chemical and geological properties that influence the structure and function of ecological systems. Selected standard techniques used to observe, sample and describe natural systems. Required Core: Life and Physical Sciences Flexible Core: Scientific World (Group E)
Special Features (e.g., linked courses)	
Sample Syllabus	Syllabus must be included with submission, 5 pages max recommended

Indicate the status of this course being nominated:

X current course revision of current course a new course being proposed

CUNY COMMON CORE Location

Please check below the area of the Common Core for which the course is being submitted. (Select only one.)

Required	Flexible	
English Composition	World Cultures and Global Issues	Individual and Society
Mathematical and Quantitative Reasoning	US Experience in its Diversity	X Scientific World
X Life and Physical Sciences	Creative Expression	

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:	
	• Read and listen critically and analytically, including identifying an argument's major assumptions and assertions and evaluating its supporting evidence.
	• 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.
	• Demonstrate research skills using appropriate technology, including gathering, evaluating, and synthesizing primary and secondary sources.
	• Support a thesis with well-reasoned arguments, and communicate persuasively across a variety of contexts, purposes, audiences, and media.
	• Formulate original ideas and relate them to the ideas of others by employing the conventions of ethical attribution and citation.
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:	
	• Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
	• Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
	• Represent quantitative problems expressed in natural language in a suitable mathematical format.
	• Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
	• Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.
	• Apply mathematical methods to problems in other fields of study.

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:	
Students will understand the basic principles of physics and chemistry as they apply to the environment. Students will learn the chemical structure and physical properties that influence the structure and function of ecological systems. Students will learn the Chemical and Physical Properties of the environment as it relates to relates to global warming, stratospheric ozone depletion, acid rain, the carbon and nitrogen cycles, chemical and industrial pollution, the impact of fossil fuels, nuclear energy, and treatment.	• Identify and apply the fundamental concepts and methods of a life or physical science.
Students will apply the scientific method to explore the chemical structure and physical properties that influence the structure and function of ecological systems. 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 society and the environment in terms of basic principles of chemistry and physics. Students will also analyze changes due to increasing technological and scientific developments in environmental issues in terms of basic principles of chemistry and physics. 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 and physics. Students will also present their findings in writing both formally and informally in the form of a research paper and in class essays.	• Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.
Students will apply the basic techniques of the physical and chemical sciences collaboratively in laboratory to further their understanding of ecological systems. Students will conduct experiments in: Measuring Ocean Water Density/Temperature, Making Ocean Water, Determining pH of Ocean Water, Measuring DO in Ocean Water, Measuring Nitrogen Compounds, Analyzing DO in the Water Column, Measuring Sewage Pollution, Counting and Observing Plankton Data, Graphing Biodiversity in Marine Biota, Locating and Graphing Marine Sanctuaries, Graphing Fishery Data, Monitoring Water Quality in Sheepshead Bay.	• Use the tools of a scientific discipline to carry out collaborative laboratory investigations.
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.	• Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.
Students will accumulate information from scientific publications and public media including data, reports, opinions, and policies regarding contemporary environmental issues. In class discussion will stress ethical issues and unbiased conclusions from presented data in terms of basic chemistry and physics principles. Controversial environmental issues and common misconceptions will be addressed within the scientific framework of basic principles of chemistry and physics. Students will present their findings in writing both formally and informally in the form of a research paper and in class essays.	• Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.

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.

	• Gather, interpret, and assess information from a variety of sources and points of view.
	• Evaluate evidence and arguments critically or analytically.
	• Produce well-reasoned written or oral arguments using evidence to support conclusions.

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

	• 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.
	• Analyze culture, globalization, or global cultural diversity, and describe an event or process from more than one point of view.
	• Analyze the historical development of one or more non-U.S. societies.
	• Analyze the significance of one or more major movements that have shaped the world's societies.
	• 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.
	• Speak, read, and write a language other than English, and use that language to respond to cultures other than one's own.

B. U.S. Experience in its Diversity

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

	• Gather, interpret, and assess information from a variety of sources and points of view.
	• Evaluate evidence and arguments critically or analytically.

	• Produce well-reasoned written or oral arguments using evidence to support conclusions.
A course in this area (II.B) must meet at least three of the additional learning outcomes in the right column. A student will:	
	• 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.
	• Analyze and explain one or more major themes of U.S. history from more than one informed perspective.
	• Evaluate how indigenous populations, slavery, or immigration have shaped the development of the United States.
	• Explain and evaluate the role of the United States in international relations.
	• Identify and differentiate among the legislative, judicial, and executive branches of government and analyze their influence on the development of U.S. democracy.
	• 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.
C. Creative Expression	
A Flexible Core course must meet the three learning outcomes in the right column.	
	• Gather, interpret, and assess information from a variety of sources and points of view.
	• Evaluate evidence and arguments critically or analytically.
	• Produce well-reasoned written or oral arguments using evidence to support conclusions.
A course in this area (II.C) must meet at least three of the additional learning outcomes in the right column. A student will:	
	• 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.
	• 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.
	• Articulate how meaning is created in the arts or communications and how experience is interpreted and conveyed.

	• Demonstrate knowledge of the skills involved in the creative process.
	• Use appropriate technologies to conduct research and to communicate.
D. Individual and Society A Flexible Core course must meet the three learning outcomes in the right column.	
	• Gather, interpret, and assess information from a variety of sources and points of view.
	• Evaluate evidence and arguments critically or analytically.
	• Produce well-reasoned written or oral arguments using evidence to support conclusions.
A course in this area (II.D) must meet at least three of the additional learning outcomes in the right column. A student will:	
	• 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.
	• Examine how an individual's place in society affects experiences, values, or choices.
	• Articulate and assess ethical views and their underlying premises.
	• Articulate ethical uses of data and other information resources to respond to problems and questions.
	• Identify and engage with local, national, or global trends or ideologies, and analyze their impact on individual or collective decision-making.

E. Scientific World A Flexible Core course must meet the three learning outcomes in the right column.	
Students will accumulate information from scientific publications and public media including data, reports, opinions, and policies regarding contemporary environmental issues. Controversial enviornemntal subjects and common misconceptions will be addressed within the scientific framework of basic principles of chemistry and physics.	• Gather, interpret, and assess information from a variety of sources and points of view.
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 society and the environment in terms of basic principles of chemistry and physics. Students will analyze changes due to increasing technological and scientific developments in climate change in terms of basic principles of chemistry and physics. In class discussion will stress ethical issues and unbiased conclusions from presented data in terms of basic chemistry and physics principles.	• Evaluate evidence and arguments critically or analytically.
Students will present their findings during lecture presenting oral arguments for or against a particular opinion in terms of basic principles of chemistry and physics. Students will also present their findings in writing both formally and informally in the form of a research paper and in class essays.	• Produce well-reasoned written or oral arguments using evidence to support conclusions.
A course in this area (II.E) must meet at least three of the additional learning outcomes in the right column. A student will:	
Students will understand the basic principles of physics and chemistry as they apply to the structure and function of ecological systems. Students will learn the chemical structure and physical properties of that influence the structure and function of ecological systems. Students will learn the Chemical and Physical Properties of the environment as it relates to global warming, stratospheric ozone depletion, acid rain, the carbon and nitrogen cycles, chemical and industrial pollution, the impact of fossil fuels, nuclear energy, and treatment. Student will learn the principles of conservation of energy and mass.	• 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.
Students will apply the basic techniques of the physical and chemical sciences in laboratory to further their understanding of the environment. 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: Measuring Ocean Water Density/Temperature, Making Ocean Water, Determining pH of Ocean Water, Measuring DO in Ocean Water, Measuring Nitrogen Compounds, Analyzing DO in the Water Column, Measuring Sewage Pollution, Counting and Observing Plankton Data, Graphing Biodiversity in Marine Biota, Locating and Graphing Marine Sanctuaries, Graphing Fishery Data, Monitoring Water Quality in Sheepshead Bay.	• Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions.
Students will learn how to read and interpret the tables, graphs and indices used to evaluate and measure selected physical, chemical and geological properties that influence the structure and function of ecological systems.	• Articulate and evaluate the empirical evidence supporting a scientific or formal theory.

Student will be able relate the chemical structure and physical properties of the environment to the functioning of ecological systems. Student will understand how the chemical structure and physical properties of food relate to global warming, stratospheric ozone depletion, acid rain, the carbon and nitrogen cycles, chemical and industrial pollution, the impact of fossil fuels, nuclear energy, and treatment. Students will analyze changes due to increasing technological and scientific developments in climate change in terms of basic principles of chemistry and physics. In class discussion will stress ethical issues and unbiased conclusions from presented data in terms of basic chemistry and physics principles.	• Articulate and evaluate the impact of technologies and scientific discoveries on the contemporary world, such as issues of personal privacy, security, or ethical responsibilities.
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 controversial environmental issues and common misconceptions will be addressed within the scientific framework of basic principles of chemistry and physics.	• Understand the scientific principles underlying matters of policy or public concern in which science plays a role.

Kingsborough Community College
The City University of New York
Department of Physical Sciences
SCI 5100 – PHYSICAL SCIENCES AND THE ENVIRONMENT (WITH LABORATORY)
Syllabus

SCI 5100 – PHYSICAL SCIENCES AND THE ENVIRONMENT (WITH LABORATORY) (3 crs. 5 hrs.)
An investigation of important topics that involve the state of the environment from a scientific perspective. This course will cover topics that include global warming, stratospheric ozone depletion, acid rain, the carbon and nitrogen cycles, chemical and industrial pollution, the impact of fossil fuels, nuclear energy, and treatment. The gathering, analysis, interpretation, and presentation of scientific data. The measure of selected physical, chemical and geological properties that influence the structure and function of ecological systems. Selected standard techniques used to observe, sample and describe natural systems.

Section: SECTION NUMBER Time: LECTURE AND LABORATORY SCHEDULE FOR SECTION
Room: ROOM (S) FOR SECTION
Instructor: INSTRUCTOR FOR SECTION Email: EMAIL ADDRESS FOR INSTRUCTOR FOR SECTION
Office Hours: OFFICE HOURS FOR INSTRUCTOR FOR SECTION

Source materials Withgott, J. and Brennan, S.(2008) *Environment: The Science Behind the Stories* 4th Ed Pearson Benjamin Cummings Publisher Scientific calculator – You may not use a cell phone as a calculator on an exam!

Student Learning Outcomes Students will:
1. understand the basic principles of physics and chemistry as they apply to the environment.
2. learn the chemical structure and physical properties of that influence the structure and function of ecological systems
3. be able relate the chemical structure and physical properties of the environment to the function of ecological systems.
4. understand how the chemical structure and physical properties of the environment relate to global warming, stratospheric ozone depletion, acid rain, the carbon and nitrogen cycles, chemical and industrial pollution, the impact of fossil fuels, nuclear energy, and treatment.
5. apply the basic techniques of the physical and chemical sciences in laboratory to further their understanding of the environment.
6. demonstrate how tools of science, technology, or formal analysis can be used to analyze problems and develop solutions.
7. learn how to read and interpret the tables, graphs and indices used to evaluate and measure selected physical, chemical and geological properties that influence the structure and function of ecological systems.
8. 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 write form.

Topical Outline Lecture: (Approximate and subject to change upon notification)

Week	Topics
1	Foundations of Environmental Science & The Scientific Method
2	The Biosphere
3	Energy Relationships
4	Ecological Relationships
5&6	Environmental Problems: Global Warming, Acid Rain and Ocean Acidification, Toxic Chemicals, Sewage Pollution, Oil Pollution, Turbidity, Land Degradation, Litter Pollution & Commercial Exploitation
7&8	Natural Resource Management and Conservation: Fisheries, Fossil Fuels, Agriculture, Aquaculture, Stewardship
9 &10	Endangered Species & Ecotourism
11	Alternative Energy Sources Wind Power, Tidal Power, Hydroelectric Power, Solar Power, Hydrogen Fuel Cells, Biomass Conversion, Nuclear Energy, Geothermal Energy
12	Student Oral Presentations
13	Final Exam - As per official College Final Schedule

Evaluation:

- 3 Exams – 20% each

Exams are definition, problems, short answer, and essay. Once side of a 3x5 index card filled with notes may be created and used for an exam.

- Term Paper and Group Oral Presentation - 20%

Students will choose a topic to research. A specific detailed format for this assignment will be provided. In brief: you will share your work with the class in a 10 minute presentation and submit a 5 page, 12pt Times New Roman Font, 1 inch margins, plus a bibliography. First Draft due DATE , Final Draft due DATE, and the Final Paper will be due DATE along with your presentation.

- Laboratory - 20%

You are responsible for being in laboratory on time. Laboratory assignment cannot be made up. Laboratory reports, unless otherwise specified, must be turned in at the end of class. As part of your laboratory final, you may bring all laboratory reports to class to assist you on your final.

Grades will be awarded as follows: 93% or above=**A**; 90-92.99%=**A-**; 87-89.99%=**B+**; 83-86.99%=**B**; 80-82.99%=**B-**; 77-79.9%=**C+**; 73-76.99%=**C**; 70-72.99%=**C-**; 67-69.99%=**D+**; 63-66.99%=**D**; 60-62.99%=**D-**; <60%=**F**

Missed Exam/Laboratory/Lecture/Assignment Policy

Attending all classes is mandatory. The textbook is a guide for the course additional material will be covered during lecture meetings. If you miss class, you will miss out on taking notes and this ***will*** affect your ability to study for tests and quizzes. If you miss an opportunity to demonstrate your knowledge of the subject matter by missing a duly scheduled exam, laboratory or other assignment, the grading scheme does not apply. Your grade will be determined at the discretion of the instructor. By missing a duly scheduled exam, laboratory or other assignment, you accept and recognize that the instructor must determine your grade within the context of determining the grade of students who did not miss a duly scheduled exam, laboratory or other assignment. Instructor Make-up Policy: SUGGESTED: NO MAKE-UP EXAMS, NO MAKE-UP LABORATORIES OR NO MAKE-UP OTHER ASSIGNMENTS. FINAL EXAM WEIGHTED WITH PENALTY (0-100%) FOR MISSED WORK

Conduct: Students are required to follow *The Student Code of Conduct* as stated in the *Student Handbook.*

Accessibility: Access-Ability Services (AAS) serves as a liaison and resource to the KCC community regarding disability issues, promotes equal access to all KCC programs and activities, and makes every reasonable effort to provide appropriate accommodations and assistance to students with disabilities. You must contact Access-Ability Services if you require such accommodations and assistance. Your instructor will make the accommodations you need, but you must have documentation from the Access-Ability office for any accommodations.

Laboratory

Meeting	Topic	Requirements
1	Measuring Ocean Water Density/Temperature	Hand in
2	Making Ocean Water	Hand in
3	Determining pH of Ocean Water	Hand in
4	Measuring DO in Ocean Water	Hand in
5	Measuring Nitrogen Compounds	Hand in
6	Analyzing DO in the Water Column	Hand in
7	Measuring Sewage Pollution	Hand in
8	Counting and Observing Plankton Data	Hand in
9	Graphing Biodiversity in Marine Biota	Hand in
10	Locating and Graphing Marine Sanctuaries	Hand in
11	Graphing Fishery Data	Hand in
12	Monitoring Water Quality in Sheepshead Bay	Hand in

Laboratory Manual: All labs are posted on the physical science department webpage. Labs need to be downloaded and read before coming to lab. You will not be permitted in the laboratory if you do not have a copy of the experiment.

Note on laboratory component: The laboratory component counts for 20% of your overall result. Failure to pass the laboratory component of the course will result in a grade of F in the course. It is important to note that the laboratory component of the course serves a dual purpose. It offers the opportunity for students to deepen their understanding of a specific experimental science. The laboratory also offers the instructor an opportunity to assess each student's competence in the subject area. The laboratory grade is based on the quality of your work in the laboratory and the quality of your laboratory assignments. Laboratory instructors may assess your competence in the subject through the use of pre-lab assignments, reports, quizzes or practical examinations. All laboratory meetings are mandatory. Performing an experiment at an alternate time will be considered only under exceptional cases. If you miss more than one laboratory meeting you may fail the laboratory portion of the course and, hence, the entire course. All laboratory assignments must be completed and handed in within the time limits set by your laboratory instructor. Laboratory meetings are subject to the regulations of the New York City Fire Department and the laws of the State of New York. If your instructor is concerned that you are unprepared or unable to safely complete a given experiment you may be asked to leave the laboratory and will not receive credit for the meeting. Examples of reasons for an instructor's duty of action include a student arriving late to the meeting, improper attire, failure to study the laboratory experimental protocol, or a general lack of laboratory competence.