KINGSBOROUGH COMMUNITY COLLEGE
The City University of New York

## CURRICULUM DATA TRANSMITTAL SHEET

**DEPARTMENT** Tourism and Hospitality **DATE** 8/11/2015

**Title of Course or Degree:** CA990 Culinary Concepts Course for A.A.S. in Culinary Arts

**Change(s) Initiated:** (Please check)

- ☐ Closing of Degree
- ☐ Closing of Certificate
- ☐ New Certificate Proposal
- ☐ New Degree Proposal
- ☒ New Course
- ☐ New 82 Course
- ☐ Deletion of Course
- ☐ Other (please describe): _____
- ☐ Change in Degree or Certificate Requirements
- ☐ Change in Degree Requirements (adding concentration)
- ☐ Change in Pre/Co-Requisite
- ☐ Change in Course Designation
- ☐ Change in Course Description
- ☐ Change in Course Titles, Numbers, Credits &/or Hours
- ☐ Change in Academic Policy

PLEASE ATTACH PERTINENT MATERIAL TO ILLUSTRATE AND EXPLAIN ALL CHANGES

I. DEPARTMENTAL ACTION

Action by Department and/or Departmental Committee, if required:

Date approved 7/15/15 Signature, Committee Chairperson: _____

Signature, Department Chairperson: _____

II. PROVOST ACTION

Provost to act within 30 days of receipt and forward to College-wide Curriculum Committee exercising one of the following options:

A. Approved ☐ B. Returned to department with comments ☐

Recommendations (if any): _____

Signature, Provost: _____ Date: _____

III. CURRICULUM SUB-COMMITTEE RECOMMENDATIONS:

A. Approved ☐ B. Tabled ☐ (no action will be taken by Curriculum Committee)

Recommendations (if any): _____

Signature, Sub-Committee Chair: _____ Date: _____

IV. COLLEGE-WIDE CURRICULUM COMMITTEE ACTION

Committee to act within 30 days of receipt, exercising **one** of the following options:

A. Approved ☐ (forwarded to Steering Committee)
B. Tabled ☐ (Department notified)
C. Not Approved ☐ (Department notified)

Signature, Chairperson of Curriculum Committee _____ Date: _____

*Revised/Oct.2013*

KINGSBOROUGH COMMUNITY COLLEGE
THE CITY UNIVERSITY OF NEW YORK

# FORMAT FOR PRESENTATION OF CURRICULUM PROPOSALS

1. **DEPARTMENT, COURSE NUMBER AND TITLE:**

   Department of Tourism and Hospitality
   CA 990
   Culinary Concepts

2. **DOES THIS COURSE MEET A GENERAL EDUCATION / CUNY CORE CATEGORY? IF YES, PLEASE COMPLETE AND SUBMIT WITH THIS PROPOSAL A CUNY COMMON CORE SUBMISSION FORM.**

   No

3. **TRANSFERABILITY OF THIS COURSE. DESCRIBE HOW THIS COURSE TRANSFERS (required for A.S. degree course). If A.A.S. degree course and does not transfer, justify role of course, i.e., describe other learning objectives met:**

   This course lays the foundation for success in entry-level employment. The course provides students with an accelerated start into the industry by emphasizing the competencies most sought-after by employers: a thorough understanding of basic kitchen procedures and how those functions relate to the larger flow of business operations. Meanwhile, the course will lay a strong foundation of core culinary concepts, firmly positioning students for progressive skill-building in CA 1, CA 2, CA 11, CA 12, and CA 50.

4. **BULLETIN DESCRIPTION OF COURSE:**

   Introduces core culinary procedures, including reading and converting recipes, measuring and substituting ingredients, and shifting from small-scale to large-scale recipe production. Through applied recipe testing, the course will review how these foundational skills influence both the finished product and more complex restaurant operations, including menu development, purchasing, and cost control.

5. **NUMBER OF WEEKLY CLASS HOURS (please indicate the number of hours per week spent in a practical kitchen exercise, hours spent on site doing fieldwork, hours of supervision and hours in classroom-- if applicable):**

   3 hours – classes will alternate between classroom and practical kitchen exercises every other week

6. **NUMBER OF CREDITS:**

   3

7. **COURSE PREREQUISITES AND COREQUISITES**

**A. PREREQUISITES:** Passing Score on Part 1 on the CUNY Mathematics Skills Test (COMPASS) or passing MAT M100
**B. COREQUISITES:** None
**C. PRE OR COREQ:** None

8. **BRIEF RATIONALE TO JUSTIFY PROPOSED COURSE TO INCLUDE:**

**A. ENROLLMENT SUMMARIES, IF PREVIOUSLY OFFERED AS AN 82**
N/A

**B. PROJECTED ENROLLMENT**
15 – 18

**C. CLASS LIMITS**
18 (class will meet in the kitchen each week)

**D. FREQUENCY COURSE IS LIKELY TO BE OFFERED**
Fall and Spring semesters

**E. ROLE OF COURSE IN DEPARTMENT'S CURRICULUM AND COLLEGE'S MISSION**
This course develops the foundational skills necessary for CA 1, CA 11, and CA 50 by offering students an introduction to kitchen operations through recipe mechanics. This course is unique in that it combines lecture and practical kitchen exercises to emphasize the connection between basic kitchen functions and cost control in a foodservice operation. The course will introduce the fundamental culinary concepts necessary for students to execute more complex applications in subsequent courses. As students progress through the degree, they will develop an acute ability to understand how daily kitchen procedures affect the larger operation, an underlying concept first introduced in CA 990.

9. **LIST OF COURSES, IF ANY, TO BE WITHDRAWN WHEN COURSE(S) IS (ARE) ADOPTED:**

Introduction to Business (BA 1100)
Labor Relations & Customer Service Practices (TAH 500)

10. **IF COURSE IS AN INTERNSHIP OR INDEPENDENT STUDY OR THE LIKE, PROVIDE AN EXPLANATION AS TO HOW THE STUDENTS WILL EARN THE CREDITS AWARDED. THE CREDITS AWARDED SHOULD BE CONSISTENT WITH STUDENTS' EFFORTS REQUIRED IN A TRADITIONAL CLASSROOM SETTING:**

N/A

11. **PROPOSED TEXT BOOK(S) AND/OR OTHER REQUIRED INSTRUCTIONAL MATERIAL(S):**

Blocker, Linda, and Julie Hill. Culinary Math. Hoboken, NJ: John Wiley, 2007. Print.

Gisslen, Wayne. Professional Cooking. New York, NY: Wily & Sons, 2015.

12. **REQUIRED COURSE FOR MAJORS AND/OR AREA OF CONCENTRATION? (If course is required, please submit a separate transmittal with a degree requirement sheet noting the proposed revisions, including where course fits into degree requirements, and what course(s) will be removed as a requirement for the degree. NYSED guidelines of 45 crs. of Liberal Arts coursework for an A.A. degree, 30 crs. for an A.S. degree and 20 crs. of Liberal Arts for an A.A.S. degree must be adhered to for all 60 cr. programs).**

This is a required course for the AAS in culinary arts.

**IF OPEN ONLY TO SELECTED STUDENTS (SPECIFY):**

N/A

13. **EXPLAIN WHAT STUDENTS WILL KNOW AND BE ABLE TO DO UPON COMPLETION OF COURSE:**

Upon completion of this course, the student should be able to do the following:

- Properly handle a knife
- Set up a station
- Understand the basics of standard recipes
- Distinguish how and when to measure ingredients by weight and volume
- Properly use scales, measuring cups, and measuring spoons
- Basic produce fabrication: peeling, trimming, and coring
- Understand and apply ingredient/recipe yield terminology: as-purchased, edible portion, trim and usable trim
- Understand the application of common kitchen ratios (i.e. vinaigrette, pasta dough, mayonnaise, etc.)
- Distinguish between recipe yield and portion size
- Increase and decrease recipe yield and portion size
- Understand costing fundamentals: as-purchased price, edible portion cost, selling price

14. **METHODS OF TEACHING --EG., LECTURES, LABORATORIES, AND OTHER ASSIGNMENTS FOR STUDENTS, INCLUDING ANY OF THE FOLLOWING: DEMONSTRATIONS, GROUP WORK, WEBSITE OR E-MAIL INTERACTIONS AND/OR ASSIGNMENTS, PRACTICE IN APPLICATION OF SKILLS:**

Lectures use a variety of teaching methods to further develop skills and competencies, to connect content to practical applications, and to test student understanding. These include:

- Group work
- Case studies of real world examples
- Supplemental handouts
- Quizzes
- Mid-term exam
- Final exam

Practical kitchen exercises provide students with an opportunity to apply theory and skills in a kitchen setting through various activities, including:

- Measuring ingredients
- Ingredient substitution
- Recipe testing
- Recipe conversion

Group work in teams and/or pairs to encourage teamwork and productive persistence

**15. ASSIGNMENTS TO STUDENTS:**

**In-Class Practical Kitchen Assignments:**
The course will include five kitchen practical kitchen assignments, each of which is designed to challenge students with applying a foundational culinary concept in a practical setting (the kitchen). This dual approach – introducing a concept in theory and testing the concept in practice – will help students better understand common kitchen operations at a conceptual level and will propel the development of tangible kitchen skills needed for future classes. The culinary concepts covered in the practical kitchen exercises include:

- Proper use of kitchen equipment
- Ingredient measurement by volume vs. weight
- Produce fabrication and ingredient yield
- Testing common kitchen ratio recipes
- Recipe conversion and basic costing

Students will be graded based on the following criteria: concept application, thoroughness, participation and teamwork, communication, organization, and kitchen safety and sanitation (where applicable).

**Recipe Project**
In Week 8, students will be introduced to the fundamentals of standard recipes as well as methods for converting small-batch recipes for large volume production. To help students understand the application of these core skills, they will be asked to:

- Select a small-batch recipe from a cookbook, magazine, or online resource
- Convert each recipe to yield 75 portions and half scale
- Present in person and in a writing assignment:
    - The original recipe in standard format
    - Why the student chose the recipe(s)
    - A recipe cost sheet for the original recipe
    - The converted recipes in standard format
    - Obstacles and solutions to converting the recipe(s)
    - List of required equipment (for cooking, storage, etc.) for new, high-volume recipe

**16. DESCRIBE METHOD OF EVALUATING LEARNING SPECIFIED IN #15:**

25% Class participation and activities
25% In-class practical kitchen exercises assignments
15% Mid-term exam
15% Recipe project
20% Final exam

*100% Total*

The following rubric is used to assess the in-class kitchen practical kitchen exercise activity:

| Criteria | Professional | Experienced | Developing | Novice |
|---|---|---|---|---|
| **Concept Skills** | Student was an active and engaged participant and teammates could clearly point to student's contribution.<br><br>Student fully understood in-class practical kitchen assignment and quickly adapted to the needs of the assignment, helping other students along. | Student was an active and engaged participant in the team and student's contribution could be discerned.<br><br>Student understood in-class practical kitchen assignment and adapted to the needs of the assignment. | Student worked with team but did not show evidence of engagement with the team but did contribute.<br><br>Student understood in-class practical kitchen assignment and took direction from classmates. | Student did not show evidence of engagement with team and did not significantly contribute.<br><br>Student misunderstood in-class practical kitchen assignment or did not adapt to the needs of the assignment. |
| **Verbal Communication and Teamwork** | Student communicates well with teammates, chef instructor, and class at large; anticipates the needs of others. | Student communicates well with teammates and chef instructor. | Student communicates with teammates and chef instructor but does not help out beyond his/her own team. | Student does not communicate well with teammates or chef instructor and prefers to work as an individual. |
| **Organization and Sanitation (where applicable)** | Student used proper safety and sanitation procedures as outlined in class: correct use of 3-bays sink, properly anchored cutting board, sharp knives, full clean uniform with hair covered and restrained, clean apron, and proper use of side towels. Student demonstrated excellent organizational skills with mise en place and laboratory activity. | Student mostly used proper safety and sanitation procedures as outlined in class: correct use of 3-bays sink, properly anchored cutting board, sharp knives, full clean uniform with hair covered and restrained, clean apron, and proper use of side towels. Student demonstrated good organizational skills with mise en place and laboratory activity. | Student showed some knowledge of the proper safety and sanitation procedures as outlined in class: correct use of 3-bays sink, properly anchored cutting board, sharp knives, full clean uniform with hair covered and restrained, clean apron, and proper use of side towels. Student demonstrated fair | Student showed little to no knowledge of the proper safety and sanitation procedures as outlined in class: correct use of 3-bays sink, properly anchored cutting board, sharp knives, full clean uniform with hair covered and restrained, clean apron, and proper use of side towels. Student demonstrated poor |

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| | | | organizational skills with mise en place and laboratory activity. | organizational skill with mise en place and laboratory activity. |

**17. TOPICAL COURSE OUTLINE (WHICH SHOULD BE AS SPECIFIC AS POSSIBLE REGARDING TOPICS COVERED, LEARNING ACTIVITIES AND ASSIGNMENTS):**

## COURSE SCHEDULE:

| DATE: | TOPIC: | TO BE DISCUSSED AND EXPLORED: | READING ASSIGNMENTS AND HOMEWORK: |
|---|---|---|---|
| 1: | Introduction<br><br>Safe Kitchens<br><br>Knives<br><br>Recipes as Formulas | What this course is, what to expect, and what is expected.<br><br>Creating and working in a safe environment. Parts of a knife.<br><br>How to read and interpret recipes to guide foodservice production, budgeting, and purchasing. | Due for Next Class:<br><br>Blocker: chapters 1, 2, 3,<br><br>Glissen: pages 35-39, 56-59, 105-108, 142 |
| 2: | Mise en Place, Stations<br><br>Weights and Measures<br><br>Measuring Tools | Mise en Place & Setting up a Station.<br><br>How and when to use weights, measures, and metrics for ordering, cooking, baking, and other common kitchen operations.<br><br>**Tools of Measurement In-Class Exploration**: Using scales, measuring cups, measuring spoons, and other utensils. | Due for Next Class:<br><br>Blocker: chapters 1, 2, 3, 15<br><br>Glissen: pages 35-39, 56-57, 105-108 |
| 3: | Recipes & Ratios<br><br>Lab: Weights and Measures Lab | Introducing common kitchen ratios in recipes.<br><br>Review and worksheet of weights and measures.<br><br>**Volume and Weight In-Class Project**: using rice, cornmeal, and water, compare and evaluate the different ways and accuracies of measuring an ingredient. Written response in class. | Due for Next Class:<br><br>Blocker: chapters 4, 5, 6<br><br>Glissen: 105-106, 109 |
| 4: | Converting Units of Measure in a Recipe | How and when to convert ingredients *in* volume and weight.<br><br>How and when to convert ingredients *between* volume and weight.<br><br>How and when to convert "each" or individual ingredients without weight to a weighted amount. | Due for Next Class:<br><br>Blocker: chapters 7, 8, 12<br><br>Glissen: 531 Chapter 16 describes many vegetables and their yields. |

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| 5: | Produce<br><br>Yield, As Purchased Quantity, Edible Portion | Produce: parts we eat, growth cycle, nomenclature, descriptors, and grades.<br><br>Fabrication of the produce: As Purchased Quantity, Edible Portion, Trim<br><br>Determining ingredient Yield and Yield Percent. | Due for Next Class:<br><br>Blocker: chapters 7, 8, 12<br><br>Glissen: 115-119, 142-143 |
| 6: | Meat Yields: Raw and Cooked Yields | Meat Yields: raw and cooked, how to determine and why.<br><br>**Yield In-Class Project**: using a provided recipe, determine the purchase amount based upon the edible portion required in the recipe. | Due for Next Class:<br><br>Blocker: chapters 9, 10, 11 |
| 7: | Knife cuts and Vinaigrette<br><br>Yield | Basic produce fabrication: peeling, trimming, coring, and slicing.<br><br>Recipes by ratio: vinaigrette.<br><br>**Yield In-Class Project**: using various vegetables, students will cut crudité, measuring and noting yields of different ingredients, by ingredient, creating our own Yield Percentages, and then comparing it to the yield charts in the book. | Due for Next Class:<br><br>Glissen: 81-84, 100-105 |
| 8: | Recipe Sources: Cookbooks, Magazines, and Online<br><br>Portion Sizes | *Meet in Library or Computer Lab?*<br><br>Recipes: writing editing styles, reading the intent and audience, looking at language of ingredient quantity and preparation.<br><br>Determining and changing portion size, quantity made (yield) vs. portion size. | Due for Next Class:<br><br>Blocker: chapters 11, 14<br><br>Glissen: 119-120<br><br>Find recipe, *not from Glissen.* |
| 9: | Introductory Ordering and Recipe Costing:<br><br>• Cost per Unit<br><br>• Edible Portion Cost<br><br>• Costing Recipes | ***Recipe is due**; to be looked over in class and approved.*<br><br>Determining how ingredients are sold and how much to order.<br><br>Determining Cost per Unit and Edible Portion Cost.<br><br>Costing out recipes. | Due for Next Class:<br><br>Blocker: chapter 13<br><br>Glissen: 109-114 |

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| 10: | Recipe Conversions<br><br>Introduction to Menu Pricing<br><br>Introduction to Beverage Costing | Recipe Conversions:<br><br>How and when to use the Recipe Conversion Factor to change the yield of a recipe.<br><br>Challenges of converted recipes.<br><br>Determining selling price based on portion cost.<br><br>Selling price; the costs of overpours.<br><br>**Costing and Conversion In-Class Project**: Working in groups, and using a provided purchase order, cost out a provided recipe, determine price per portion, and selling price. Then convert the recipe for 65 portions, and present on the possible problems with the converted recipe. | Due for Next Class:<br><br>Independent Project<br><br>Glissen: 93-101 |
| 11: | Menus | ***Independent Project Due***<br><br>Creating and analyzing menus. | |
| 12: | Review | Review of entire course; practice test. | Due for Next Class: **Study for the Final!** |
| | **Final** | | |

**18. SELECTED BIBLIOGRAPHY AND SOURCE MATERIALS:**

Blocker, Linda, and Julie Hill. Culinary Math. Hoboken, NJ: John Wiley, 2007. Print.

Gisslen, Wayne. Professional Cooking. New York, NY: Wily & Sons, 2015.

*Note*: Designing curricula that reinforces productive persistence. Lessons adapted from, "Modules 1 through 5," by the Carnegie Networked Improvement Community, 2013. Copyright 2013 by Carnegie Foundation for the Advancement of Teaching.

**Please contact your Department Chairperson or Associate Dean Stanley Bazile at the Office of Academic Affairs x5328, if you require any assistance completing a course proposal according to this format. Copies of this format are available electronically.**

# 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.

| | |
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| **College** | Kingsborough Community College |
| **Course Prefix and Number (e.g., ANTH 101, if number not assigned, enter XXX)** | SCI 3700 |
| **Course Title** | Developments in the Physical Sciences |
| **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 3700 – DEVELOPMENTS IN THE PHYSICAL SCIENCES (WITH LABORATORY) (3 crs. 5 hrs.) Basic concepts in the physical sciences and their applications in today's technologically advanced world are presented. The impact that modern technology has on our physical environment is examined. Selected topics include: pollution, ozone layer depletion, global climate change, pesticides and chemicals in food, energy sources (renewable and non-renewable), and medical and military applications of technology. Students will engage in science through application of the methods of science (e.g. empirical, experimental and the scientific method). Students will develop the ability to formulate strong, logical, science-based arguments, evaluate and discuss environmental issues, and test hypothesis to improve problem solving skills. 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<br><br>**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<br><br>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<br><br>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<br><br>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 physical sciences and their applications in today's technologically advanced world. Students will learn the chemical structure and physical properties of their physical environment. Student will learn the Chemical and Physical Properties of their environment as it relates to pollution, ozone layer depletion, global climate change, pesticides and chemicals in food, energy sources (renewable and non-renewable), and medical and military applications of technology. Student will learn the principles of conservation of energy and mass. | • 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 of their physical environment. 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 physical sciences in terms of basic principles of chemistry and physics. Students will also analyze changes due to increasing technological and scientific developments in topics such as pollution, ozone layer depletion, global climate change, pesticides and chemicals in food, energy sources (renewable and non-renewable), and medical and military applications of technology 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 their physical environment. Students will conduct experiments in: Density, Seawater, Inorganic Substances, Properties of Oxygen, Types of Reactions, Titration of a Commercial Antacid, Graphing,Radioactivity, Organic Chemistry. | • 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 physical sciences. In class discussion will stress ethical issues and unbiased conclusions from presented data in terms of basic chemistry and physics principles. 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. |

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| **II. Flexible Core (18 credits)**<br>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**<br>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. |

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| | • 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. |

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| | • Demonstrate knowledge of the skills involved in the creative process. |
| | • Use appropriate technologies to conduct research and to communicate. |
| **D. Individual and Society**<br>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**<br><br>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 the physical sciences. Controversial environmental issues 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 physical sciences in terms of basic principles of chemistry and physics. Students will analyze changes due to increasing technological and scientific developments in in topics such as pollution, ozone layer depletion, global climate change, pesticides and chemicals in food, energy sources (renewable and non-renewable), and medical and military applications of technology 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 physical sciences. Students will learn the chemical structure and physical properties of their physical environment. Student will learn the Chemical and Physical Properties ofStudent will learn the Chemical and Physical Properties of their environment as it relates to pollution, ozone layer depletion, global climate change, pesticides and chemicals in food, energy sources (renewable and non-renewable), and medical and military applications of technology. | • 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 their physical 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: Density, Seawater, Inorganic Substances, Properties of Oxygen, Types of Reactions, Titration of a Commercial Antacid, Graphing,Radioactivity, Organic Chemistry. | • 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 their environment to the function of ecological systems.<br>Student will understand how the chemical structure and physical properties of their physical environment as it pertains to environmental issues.<br>Students will analyze changes due to increasing technological and scientific developments as it relates to environmental issues 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. |

| | |
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| 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 3700 – DEVELOPMENTS IN THE PHYSICAL SCIENCES (WITH LABORATORY)
Syllabus

SCI 3700 – DEVELOPMENTS IN THE PHYSICAL SCIENCES (WITH LABORATORY) (3 crs. 5 hrs.)
Basic concepts in the physical sciences and their applications in today's technologically advanced world are presented. The impact that modern technology has on our physical environment is examined. Selected topics include: pollution, ozone layer depletion, global climate change, pesticides and chemicals in food, energy sources (renewable and non-renewable), and medical and military applications of technology. Students will engage in science through application of the methods of science (e.g. empirical, experimental and the scientific method). Students will develop the ability to formulate strong, logical, science-based arguments, evaluate and discuss environmental issues, and test hypothesis to improve problem solving skills. Required Core: Life and Physical Sciences Flexible Core: Scientific World (Group E)

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:** The textbook is *Chemistry in Context*: *Applying Chemistry to Society* 8th Edition
Authors: Lucy Pryde Eubanks, Catherine H. Middlecamp, Carl E. Heltzel, Steven W. Keller.
ISBN 978-0-07-337566-3. 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 physical sciences and their applications in today's technologically advanced world.
2. learn the chemical structure and physical properties of their environment.
3. be able relate the chemical structure and physical properties of their environment.
4. understand how the chemical structure and physical properties of their environment as it relates pollution, ozone layer depletion, global climate change, pesticides and chemicals in food, energy sources (renewable and non-renewable), and medical and military applications of technology.
5. apply the basic techniques of the physical and chemical sciences in laboratory to further their understanding of their 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 pollution, ozone layer depletion, global climate change, pesticides and chemicals in food, energy sources both renewable and nonrenewable.
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 | Book Chapter(s) |
|---|---|---|
| 1 | Chemistry for a Sustainable Future | 0 |
| 2 | The Air We Breathe | 1 |
| 3 | Protecting the Ozone Layer | 2 |
| 4 | The Chemistry of Global Climate Change | 3 |
| 5 | Energy from Combustion | 4 |
| 6 | Water for Life | 5 |
| 8 | Neutralizing the Threats of Acid Rain and Ocean Acidification | 6 |
| 8 | The Fires of Nuclear Fission | 7 |

| | | |
|---|---|---|
| 9 | Energy from Electron Transfer | 8 |
| 10 | The World of Polymers and Plastics | 9 |
| 11 | Manipulating Molecules and Designing Drugs | 10 |
| 12 | Nutrition: Food for Thought | 11 |
| 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 | Density | Hand in |
| 2 | Seawater | Hand in |
| 3 | Inorganic Substances | Hand in |
| 4 | Properties of Oxygen | Hand in |
| 5 | Types of Reactions | Hand in |
| 6 | Titration of a Commercial Antacid | Hand in |
| 7 | Graphing handout | Hand in |
| 8 | Radioactivity | Hand in |
| 9 | Organic Chemistry | Hand in |
| 10 | Laboratory: Group Oral Presentations | Presentation |
| 11 | Laboratory: Group Oral Presentations | Presentation |
| 12 | Laboratory: Laboratory Exam | Exam |

**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.

# 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<br><br>**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<br><br>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<br><br>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<br><br>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. |

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| **II. Flexible Core (18 credits)**<br>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**<br>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. |

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| | • 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. |

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| | • Demonstrate knowledge of the skills involved in the creative process. |
| | • Use appropriate technologies to conduct research and to communicate. |
| **D. Individual and Society**<br><br>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**<br><br>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. |

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| 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. |