KINGSBOROUGH COMMUNITY COLLEGE
The City University of New York
CURRICULUM DATA TRANSMITTAL SHEET

DEPARTMENT: PHYSICAL SCIENCES **DATE:** September 2014

Title of Course or Degree Change: SCI70 THE SCIENCE OF NUTRITION

Change(s) Initiated: (Please Check)

_ **Letter of Intent**
_ **Proposal (Letter of Intent sent previously)**
_ **Closing of Degree Program**
_ **Change in Degree Requirements**
_ **New Course***
_ **Change in Discipline Code**
_ **New 82 Course**
_ **Change in Description**
_ **New Certificate Program**
_ **Deletion of Course**
_ **Change in Pre/Co-Requisite**
_ **Change in Course Titles, Numbers, Crs. &/or Hours**
X **Other (please describe):**

CUNY Common Core Course Submission
I. Required Core C. Life and Physical Sciences
II. Flexible Core E. Scientific World

PLEASE ATTACH PERTINENT MATERIAL TO ILLUSTRATE AND EXPLAIN ALL CHANGES

I. DEPARTMENTAL ACTION

Action by Department &/or Departmental Curriculum Committee, if required:
Date approved: Sep 2014 **Signature, Committee Chairperson:**
Signature, Department Chair: **Date:** Sep 2014

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 (**FOR NEW COURSES ONLY*):

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, 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** __ (and forwarded to Steering Committee)
B. **Tabled** __ (and Department notified)

Signature, Chair of Curriculum Committee: **Date:**

CUNY Common Core
Course Submission Form

Instructions: All courses submitted for the Common Core must be liberal arts courses. Courses may be submitted for only one area of the Common Core. All courses must be 3 credits/3 hours unless the college is seeking a waiver for a 4-credit Math or Science course. All standard governance procedures for course approval remain in place.

College	Kingsborough Community College
Course Number	SCI 7000
Course Title	The Science Of Nutrition
Department(s)	Physical Sciences Department
Discipline	General Science – Chemistry and Physics
Subject Area	II. Flexible Core (18 credits) E. Scientific World
Credits	4 credits
Contact Hours	5 hours (3 hours lecture and 2 hours laboratory per week)
Pre-requisites	Passing Scores on the CUNY Reading and Writing exams.
Catalogue Description	Learn and measure the physical and chemical properties that influence the structure and function of chemical properties that influence the structure and function of nutritional systems. Gain experience with practical applications of nutritional science. Practice the gathering, analysis, interpretation, and presentation of scientific data. Learn standard techniques used to observe, sample and describe natural systems. Prerequisites: Passing scores on the CUNY Reading and Writing exams.
Syllabus	Syllabus must be included with submission, 5 pages max

Waivers for 4-credit Math and Science Courses

Waivers for 4-credit courses will only be accepted in the required areas of Mathematical and Quantitative Reasoning and Life and Physical Sciences.

If you would like to request a waiver please check here:	Waiver requested
If waiver requested: Please provide a brief explanation for why the course will be 4 credits.	Allocation of hours is in keeping with college practices for a "science with a lab" course.
If waiver requested: Please indicate whether this course will satisfy a major requirement, and if so, which major requirement(s) the course will fulfill.	A.A. Liberal Arts

Indicate the status of this course being nominated:

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

Learning Outcomes

In the left column explain the assignments and course attributes 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: 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 nutrition. Students will learn the chemical structure and physical properties of food constituents. Student will learn the Chemical and Physical Properties of: Carbohydrates, Sugars, Starches, and Fiber; Fats, Oils, and Other Lipids; Proteins, Water Soluble Vitamins, Fat Soluble Vitamins, Major Minerals, and Trace Minerals. 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 food and the functions of the food constituents. 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 foods in terms of basic principles of chemistry and physics. Students will also analyze changes due to increasing technological and scientific developments in engineered and processed foods 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 food systems. Students will conduct experiments in: Metric System, Tools, Graphs, Tables, Indices of Food Science; Aromatic Chemistry; Mass Density (Body Mass Index) and Energy Balance (Calorie Intake); Conservation of Energy; Chemical Analysis of Simple Carbohydrates, Detection of Fat, Detection of Alcohol, and Building of Molecules.	• 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 food issues. In class discussion will stress ethical issues and unbiased conclusions from presented data in terms of basic chemistry and physics principles. Controversial food subjects 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 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 food issues. Controversial food 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 foods in terms of basic principles of chemistry and physics. Students will analyze changes due to increasing technological and scientific developments in engineered and processed foods 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 nutrition. Students will learn the chemical structure and physical properties of food constituents. Student will learn the Chemical and Physical Properties of: Carbohydrates, Sugars, Starches, and Fiber; Fats, Oils, and Other Lipids; Proteins, Water Soluble Vitamins, Fat Soluble Vitamins, Major Minerals, and Trace Minerals. 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 food systems. 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: Metric System, Tools, Graphs, Tables, Indices of Food Science; Aromatic Chemistry; Mass Density (Body Mass Index) and Energy Balance (Calorie Intake); Conservation of Energy; Chemical Analysis of Simple Carbohydrates, Detection of Fat, Detection of Alcohol, and Building of Molecules.	• 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 food quality and food planning.	• Articulate and evaluate the empirical evidence supporting a scientific or formal theory.

Student will be able relate the chemical structure and physical properties of food to the function of the food constituents. Student will understand how the chemical structure and physical properties of food relate to food quality, nutrition, safety, and processing. Students will analyze changes due to increasing technological and scientific developments in engineered and processed foods 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 food subjects 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 7000-The Science of Nutrition
Syllabus

Text: Wardlaw's *Perspectives in Nutrition* by Byrd-Bredbenner, Moe, Beshgetoor, and Bering
Time: LECTURE AND LABORATORY SCHEDULE FOR EACH SECTION
Room: ROOM FOR EACH SECTION
Instructor: INSTRUCTOR FOR EACH SECTION
Email: EMAIL ADDRESS FOR INSTRUCTOR FOR EACH SECTION
Office Hours: OFFICE HOURS FOR INSTRUCTOR FOR EACH SECTION

Course Objectives:

1. Student will understand the basic principles of physics and chemistry as they apply to nutrition.
2. Student will learn the chemical structure and physical properties of food constituents.
3. Student will be able relate the chemical structure and physical properties of food to the function of the food constituents
4. Student will understand how the chemical structure and physical properties of food relate to food quality, nutrition, safety, and processing.
5. Students will apply the basic techniques of the physical and chemical sciences in laboratory to further their understanding of food systems.
6. Demonstrate how tools of science,, technology, or formal analysis can be used to analyze problems and develop solutions.
7. Student will learn how to read and interpret the tables, graphs and indices used to evaluate and measure food quality and food planning.
8. 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 write form.

Schedule: (Approximate and subject to change upon notification)

Week 1	The Science of Nutrition Laboratory: Metric System
Week 2	Tools, Graphs, Tables, Indices of Food Science Laboratory: Aromatic Chemistry
Week 3	Chemical and Physical Properties of Carbohydrates, Sugars, Starches, and Fiber Laboratory: Mass Density (Body Mass Index) and Energy Balance (Calorie Intake)
Week 4	Chemical and Physical Properties of Fats, Oils, and Other Lipids Laboratory: Conservation of Energy
Week 5	Chemical and Physical Properties of Proteins Laboratory: Chemical Analysis of Simple Carbohydrates
Week 6	Energy Balance and Mass Flow Control Laboratory: Detection of Fat
Week 7	Chemical and Physical Properties Water Soluble Vitamins (Thiamin, Riboflavin, Niacin, Pantothenic Acid, Biotin, Vitamin B12, Folate) Laboratory: Detection of Alcohol

Week 8	Chemical and Physical Properties Fat Soluble Vitamins (Vitamin A, Vitamin D, Vitamin E, Vitamin K) Laboratory: Building Molecules
Week 9	Chemical and Physical Properties of Major Minerals (Continued) (Sodium, Chloride, Potassium, Calcium, Phosphorous, Magnesium, Sulfate) Laboratory: Presentation Group 1
Week 10	Chemical and Physical Properties of Major Minerals (Continued) (Sodium, Chloride, Potassium, Calcium, Phosphorous, Magnesium, Sulfate) Laboratory: Presentation Group 2
Week 11	Lecture: Chemical and Physical Properties of Trace Minerals (Iron, Copper, Zinc, Selenium, Fluoride, Chromium, Iodine, Molybdenum, Manganese, Arsenic, Boron, Nickel, Silicon, and Vanadium) Laboratory: Presentation Group 3
Week 12	Lecture: Chemical and Physical Properties of Alcohol Laboratory: Laboratory Exam
Final Exam –	As per official College Final Schedule

Evaluation:

• 3 Exams – 15% 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 the test.

• Term Paper and Presentation - 25%

Students will choose a food to analysis. Any food may be chosen from a cashew to a Twinkie. The student will use the nutritional label to begin their research. Nutritional labels are located on packages of many foods or may be found online. You will take this information and build upon it with your knowledge gained from class as well as additional research. This information will be shared with the class in a 5 minute presentation. 5 pages, 12pt Times New Roman Font, 1 inch margins, plus a bibliography. First Rough Draft due October 12, Final Rough Draft due November 23, and the Final Paper will be due on December 6 along with your presentation.

• Energy Balance and Mass Control Log – 10%

This will consist of two parts: data collection and analyzation. For data collection, students are expected to keep track of their daily food intakes throughout the semester and imputed into a program such as My Plate or My Fitness Pal online. You are responsible for doing this 5 out of every 7 days in a week. The second part will be a weekly analyzation of your diet using structured questions I will give you. Both parts will be turned in on exam days.

4. 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.

• In class writings - 10% (if you are not here for these they cannot be made up)

I will bring a current nutrition article into class periodically. You will write about the article critically and we will discuss it in class. You will turn your writing in every class.

Conduct and Attendance: Students are required to follow *The Student Code of Conduct* as stated in the *Student Handbook*. Attendance is required. You are responsible for the material presented in class on days you are absent.