AGENDA

College Senate Meeting

April 28, 2010
Room E-500
2:15 p.m.

I. Approval of Minutes --- March 10, 2010, and April 7, 2010

II. Report from the Chairperson

III. Curriculum Committee Report

Proposal to Establish a Program in Environmental Science—The Department of Natural Sciences
Presented by Prof. John Shean, Chairperson of the Curriculum Committee

IV. Discussion of Counseling with Vice President Peter Katopes (Tentative)

V. Discussion of Incomplete Grade Policy

VI. Review of Reports from April 7 Meeting

1. Committee of Faculty
2. HEO's, Alumni, Civil Service

VII. Old Business
VIII. New Business
IX. Adjournment

Light Refreshments will be served.

College Senate
April 7, 2010
Meeting Notes of
HEO/Alumni/Civil Service Rep Committee

Present: Michael Johnson, Robert Levine, George McCormack, Lenore McShane, Anthony Pappas, and Eneida Rivas.

Task: Discuss the possibilities and problems with evening services.
Discussion Points:

- Group not sure if there is a need for evening services. We're not sure what's available! What more is needed than what's already available? What types of problems/complaints occur most often or every semester? For what length of time?
- Need for better communication about hours and services available in the evening. Where can one find this information? Should be posted on web; outside office doors, shown on plasmas, printed into brochures and distributed college-wide and to students, etc.
- Each department, division or service area should post their office hours outside their respective doors.
- Should there be uniformity of hours among all departments/divisions? May not be possible or necessary.
- Should there be a college-wide policy regarding evening hours? Lots of disagreement, but group agreed there needs to be some sort of uniformity.
- Suggest to Academic Departments that they open late one or two nights a week – beyond registration and change of program periods. Is this possible or necessary?
- Appoint/hire an Extended Day Services Coordinator – someone who can trouble-shoot problems and is authorized to sign and approve things – overtallies, etc.
- Does Student Ombudsman Luis Merchant have evening hours? How would students know to come to him? How are his services advertised/disseminated throughout the College?
- How many people does the Registrar's Office see in the evening? Where are they going? Financial Aid?
- How many trips does it take to get something done? If you need a copy of your transcript, is the Bursar's Office open when you need to pay for it? Group noted that the Bursar's late hours do not coincide with the late hours of the Registrar's Office. This should be looked into and changed if necessary.

Task: Any other items beyond those on Brainstorming Lists that the Senate should address?
Discussion Point:

- NO!

Task: Suggestions for improving the functioning and effectiveness of the Senate.

- We need to make a concerted effort to start Senate meetings on time instead of 20 minutes after the start time! Need to create a climate/culture that does not tolerate lateness.
- Instead of taking Senate time to break into our separate Committee groups, let's schedule an extra 2 or 3 dates on the official Senate calendar for Committee groups. In this way, everyone knows ahead of time when/where their individual Committee group will meet.

Committee of Faculty
Meeting of April 7, 2010

Topics discussed:

1. Meetings: The need to have time every other Senate meeting to meet as a committee and then report back to the Senate-at-large.

2. Agenda: The Committee of Faculty reserves the right to report directly to the Senate, as well as to formulate its own agenda.

3. Subcommittee on Academic Freedom: The entire Committee of Faculty will act as the subcommittee on academic freedom.

4. Student-Faculty Liaison Ad-Hoc Committee: The committee would like to see the creation of a student-faculty liaison ad-hoc committee, not necessarily a student-faculty teaching and learning committee. This should be an ad-hoc committee with an organic agenda. We feel that there is a need for a closer connection with students and hope that this ad-hoc committee can provide it.

5. Honors Night: It was suggested that the discussion surrounding Honors Night be postponed to the May 12th Senate meeting as the agenda for the April 28th meeting looks already quite full. More to the point, we would like the Senate Executive Committee to invite the co-chairs of Honors Night as well as the Honors Night representative from Administration to attend that Senate discussion to present their plans for Honors Night, including the new rules and regulations that seem to have been devised.

6. Counseling: A discussion of the situation of the Counseling Department at LaGuardia ensued. There are not enough counselors available to call upon when students are in distress, whether academic or psychological. Students are more and more in dire need of counselors. Faculty feel that the College lacks the proper level of service for our current student population. They would like to ask Vice President Katopes the following questions at the next Senate meeting:

    a. Where does the administration see counseling in 2 to 5 years?
    b. What is the role of Mitchell Levy?
    c. The role of HEOs in advisement?

d. There is a perception that there is not one body within the College that communicates to everyone who is involved in counseling and advisement.
e. Is there a new push to ask faculty to pick up more and more of the role of advisors?

7. Faculty Experience Survey: It was reported that this survey was discussed at the quarterly meeting of the President with the chairs of the Senate, the LG PSC Chapter, Faculty Council, and the Vice-President of the UFS.

8. Senate Budget Committee: 7% of the College's monies is non-salaried, not allocated before-hand. The Senate should have a budget committee that takes part in the discussion of the allocation of these funds.

9. Communication between departments: There should be more cooperation between departments regarding co and pre-requisites for new courses. Co-requisites should not be scheduled at the same time. When changes are made within one course or major, how does that change affect other departments. These items should be referred to the Curriculum Committee.

10. Student Stipends: The Committee of Faculty would like to have a report by the Executive Committee on the success of student stipends. What is the process? How did it work this first year?

11. Efficiency of Senate: The first suggestion was to encourage the use of parliamentary procedures throughout the meeting. This would be facilitated by the presence of a parliamentarian. Items for the next agenda should be listed at the end of each month's agenda. Creation of a budget committee.

Respectfully submitted,

Francine Egger-Sider
Chair of Senate Committee of Faculty

City University of New York
LaGuardia Community College
Department of Natural Sciences

Proposal to Establish a Program in
Environmental Science

Degree to be Awarded
Associate in Science

Effective: Fall 2010

College-Wide Curriculum Committee Approval _____

College Senate Approval _____

Dean for Academic Affairs _____

Vice President for Academic Affairs _____

TABLE OF CONTENTS

Purpose and Goals

According to LaGuardia Community College's Mission Statement adopted in 2002, the College is committed to

> " … responding creatively to changes in student population, technology, and the global economy; providing extensive support services and opportunities for a highly diverse student population; preparing students to become full participants in the economic and civil life of the City, the nation, and the world; cultivating partnerships with business, community groups, government and public schools to enhance the economic, social, cultural, and educational development of western Queens and New York City."

One area of technology, which will become progressively more important in the future but has not yet been addressed by LaGuardia Community College, is Environmental Science. This is a rapidly growing field incorporating several disciplines, but with only a limited number of programs within New York City to meet its manpower needs. In response to this need and in keeping with the goals of the College, the Department of Natural Sciences is proposing to develop a program in Environmental Science. Environmental Science covers a broad array of disciplines requiring a strong preparation in the Life Sciences and Chemistry. The proposed Environmental Science Program offers students the opportunity to prepare for transfer to Queens College. The Program also intends to provide all students in the major with training in Geographic Information Systems (GIS). Students graduating from LaGuardia with the Environmental Science major will also have the opportunity to transfer, at the junior level, into one of the Environmental Science Programs at Queens College. An articulation agreement has been reached between LaGuardia Community College and Queens College regarding this program. (Appendix B). Other articulation agreements will be pursued within the City University system as part of the program implementation plan over the next year.

Need for the Program

A combination of global and local events favors graduates in environmental science:

Opportunities in the service sector are diminishing with the collapsing economy and the movement of traditional industries overseas. Although Allied Health professionals will remain in demand, the College can graduate only a relatively small fraction of the many entering students who declare majors in nursing and other Allied Health fields. Concurrently, the challenge of environmental instability is growing, the need for alternative energy is growing and the need for monitoring contaminants is growing. So too is the need to reclaim water, air and land lost to pollution that must then be managed and conserved. Meeting these challenges provides such a powerful source of job creation that political, academic and business leaders are proposing an economic stimulus package that targets "green" job creation. Quoting Trenton, New Jersey Mayor Douglas Palmer, "This *(green job creation)* is a frontier that's going to open for the whole

country, but especially for us in the Midwest and Northeast, where we need to grow our economy." In sum, establishment of an environmental science program at LaGuardia will serve to sustain the preeminence of this institution as a leader in community college education and its success at matching the abilities of its graduates to the needs of their community.

The American Solar Society (NY Times Business section March 26, 2008) estimates that the U.S. has 8.5 million jobs in "renewable energy or energy efficient industries" and the Apollo Alliance predicts that "the U.S. could generate between three and five million more green jobs over ten years" and that "…most are "middle-skill" jobs, requiring more education than a high school diploma, but less than a four-year degree."

The current status of Environmental Science programs at the two-year level within City University shows only Bronx and Hostos Community Colleges have full degree-granting programs and of these two, only Bronx Community College has direct articulation.. At the baccalaureate level, the Colleges of Queens, Hunter and York have Environmental Science programs. Hunter College's program is housed in the Department of Geography with an emphasis in Geoscience. York College's program is in the Department of Natural Sciences and has a strong Health Science emphasis. Queens College's program is within the Department of Geology, and has with several possible tracks: Environmental Science, Environmental Geoscience and Environmental Studies. Our negotiations with Dr. Patrick Brock, the coordinator of the program at Queens College, have indicated that the Queens College program would be an excellent program for our students and that both Colleges would greatly benefit from a strong articulation agreement.

Career Opportunities

The results of industrialization and population growth have created booming career opportunities in environmental science. Various environmental initiatives from the Federal Government, including the Clean Air Act of 1970 and the Clean Water Act of 1977, have broadened the field of environmental science to include disciplines such as environmental chemistry, public health, environmental law, land and water ecology and nature conservation. Many federal agencies such as the United States Geological Service, National Oceanic and Atmospheric Administration, US Fish and Wildlife, Environmental Protection Agency and US Department of Agriculture currently employ graduates in Environmental Science. Non-profit groups, such as the Audubon Society, Wildlife Conservation Society and Riverkeeper hire environmental professionals too.

Workforce Trends

As stated previously, the American Solar Society estimates that the U.S. has 8.5 million jobs in "renewable energy or energy efficient industries". Recently business and industry, with an interest in growing the new “environmentally friendly” economy, joined together to form the Apollo Alliance. *The New Apollo Program* is a comprehensive economic investment strategy to build America’s 21st century clean energy economy and dramatically cut energy bills for families and businesses. It will generate and invest $500 billion over the next ten years and create more than five million high quality green-collar jobs. It will accelerate the development of the nation’s vast clean energy resources and move us toward energy security, climate stability and economic prosperity and it will transform America into the global leader of the new green economy. The Apollo Alliance predicts that “the U.S. could generate between three and five million more green jobs over ten years” and that "most are “middle-skill” jobs, requiring more education than a high school diploma, but less than a four-year degree."

According to the Bureau of Labor Statistics, Occupational Outlook Handbook 2008-2009

> Employment of environmental scientists is expected to increase by 25 percent between 2006 and 2016, much faster than the average for all occupations. Over the same period, employment of hydrologists should increase by 24 percent, also much faster than the average. Job growth for environmental scientists and hydrologists should be strongest in private-sector consulting firms. Growth in employment of environmental scientists and hydrologists will be spurred largely by the increasing demands placed on the environment and water resources by population growth. Further demand should result from the need to comply with complex environmental laws and regulations, particularly those regarding ground-water decontamination, clean air, and flood control.

Much job growth will result from a continued need to monitor the quality of the environment, to interpret the impact of human actions on terrestrial and aquatic ecosystems and to develop strategies for restoring ecosystems. In addition, environmental scientists will be needed to help planners develop and construct buildings, transportation corridors and utilities that protect water resources and reflect efficient and beneficial land use.

Student Interest

Student interest in the field of Environmental Science is strong. A survey conducted Spring 2008 (**Appendix A**) of Science Concentrates within the Liberal Arts and Sciences at LaGuardia Community College yielded very positive results. There were 67 respondents to the questionnaire and, of that number, 37 students (58%) stated that they would consider a career in environmental science. Their main motivation was job availability and concern for the environment. Over 90% of those who indicated an interest in environmental science said that they ultimately planned to enroll in a

baccalaureate degree.

Recruitment

The Admissions Office will conduct outreach activities in high schools and community agencies. The Divisions of Academic Affairs and Enrollment Management and Student Development will collaborate to develop and establish outreach programs and recruitment events to promote the AS in Environmental Science. Initial recruitment endeavors will be directed at the High Schools on LaGuardia's campus. The recruitment drive will extend to several other high schools in New York City, especially those with a science focus. Principals, counselors and faculty in these high schools will be informed of the AS in Environmental Science. Open houses will be held at the College High Schools and in the external community for students to explore the opportunities available in the Environmental Science field. Faculty will meet one-on-one with interested students. Prospective students from the external community will be invited to LAGCC. Specifically, CUNY On Wheels, a state-of-the-art mobile classroom and formation center will be utilized to make the AS in Environmental Science known to high school students.

Students interested in pursuing the study of Environmental Science will also be recruited from the existing Liberal Arts Math and Science degree program and open house/poster sessions. The AS in Environmental Science LAGCC will be listed in the College catalog and on the College website. The Department of Natural Sciences will house a dedicated page on its website providing information on the AS in Environmental Science, transfer opportunities and links to potential employment. Students from Middle College High School, International High School and the College Now Program will be recruited as well. In addition, recruitment will also be made through the Collegiate Science and Technology Entry Program (CSTEP), a NYS-funded program, at LAGCC.

Recruitment efforts will also highlight several support mechanisms for qualified students interested in obtaining an AS in Environmental Science at LAGCC. First, eligible students (permanent residents of NYS or US Citizens, economically disadvantaged or members of an historically underrepresented group and matriculated full-time) will be able to participate in LAGCC's CSTEP program that offers services such as academic workshops, career development seminars, textbook purchase/loan program and peer-tutoring in biology and chemistry. Students who earn an A or A- in a course can become CSTEP tutors in that course and receive financial support for their services ($11.00 per hour, students usually get 4-8 hours of work per week). Second, the NIH Bridges to the Baccalaureate Program will be advertised to potential AS in Biology majors. Students meeting the program requirements (US citizens or permanent resident underrepresented minority, GPA of at least 2.8, have taken either a biology or chemistry course) will be eligible for research support ($500.00), a monthly stipend ($480.00 per month) and additional academic support while pursuing their studies and research projects. Additionally, NIH Bridges students will be able to do a paid summer internship ($480.00 per week) with faculty at LAGCC or in various laboratories at participating senior colleges. Third, LAGCC will advertise its Louis Stokes Alliance for Minority Participation (LSAMP) program that supports qualified students (similar to the eligibility

requirements for CSTEP and NIH Bridges) in conducting research during the academic year, including the summer. Students with less than 36 credits will receive a $1,000.00 stipend and students with more than 36 credits will receive a $2,000.00 stipend for the academic year from LSAMP. Students can also apply to LSAMP in the summer to work as a full-time research scholar and receive a $3,000.00 stipend. Finally, the articulation agreement with Queens College will be publicized in the college catalog.

Projected Enrollment

Recruitment of students will begin in the Spring 2010 for Fall admission. Initial enrollment will be kept small to allow for adequate lab and lecture hall space, while new labs are being developed. We therefore propose a first class enrollment of 60 students. With the completion of new labs and lecture halls, we will increase this number to a maximum of 120 new students, beginning in the Fall 2011. Table I outlines the enrollment numbers over the next 5 years. Based on other programs in the Sciences and Allied Health which are administered within the Department of Natural Sciences, we expect an attrition rate of approximately 20% in the Freshman class and an additional 10% of those students in the Sophomore class.

TABLE I

Level	Year 1	Year 2	Year 3	Year 4	Year 5
Freshman	**60**	**120**	**120**	**120**	**120**
Sophomores	**0**	**48**	**96**	**96**	**96**
Graduates	**0**	**0**	**43**	**86**	**86**

ADVISEMENT

An advisory committee and board consisting of administrators and faculty members from LaGuardia Community College and the partnered four-year institutions will be formed to ensure that our students are adequately prepared to succeed at a senior college. The Advisory Board will meet annually subsequent to program implementation. The meetings ill provide input on the curriculum, advisement issues and faculty collaborations.

CURRICULUM

The proposed Environmental Science curriculum has been designed to give students a solid preparation in the basic sciences as well as the liberal arts. Many of the

life science courses will include a fieldwork component and will focus on New York City. After completion of the Fundamentals of Biology and Chemistry courses, the students will be introduced in the "Fundamentals of Ecology" to the basis of energy flow, ecosystem analysis and community interaction. The capstone course "Environmental Science" has an interdisciplinary approach integrating the underlying principles of global ecology with the interaction of climate, human technology and population growth. The lab portion of this course emphasizes team research on original projects, a research presentation and a submission of the written report into the students' ePortfolio.

The new Environmental Sociology course will allow the exploration of the human interactions which shape the environment. The Geographic Information Systems course will provide training in data modeling, spatial analysis and cartographic output. "GIS" is one of the key tools to understand, interpret and visualize date for use in environmental assessment.

The program will be articulated with the School of Earth and Environmental Sciences at Queens College. The School of Earth and Environmental Sciences provides an interdisciplinary approach to environmental studies allowing students to concentrate their studies in biology, chemistry or geology. Students will transfer with 60 credits and will have the opportunity to pursue a degree in Environmental Science or Environmental Studies.

ENVIRONMENTAL SCIENCE

Two Year Sequence

FULL TIME PROGRAM		
FIRST YEAR		
Fall I Semester		**Credits**
FSM039	New Student Seminar	0
SCB201	Fundamentals of Biology I	4
SCC201	Fundamentals of Chemistry I	4
ENG/ENC101	Composition I: An Introduction to Expository Writing	3
MAT120	Elementary Statistics	3
Fall II Semester		
SCG 150	Geographic Information Systems	4
	Total Credits:	**18**

Spring I Semester		**Credits**
SCB 202	Fundamentals of Biology II	4
SCC201	Fundamentals of Chemistry II	4
ENG102	Writing through Literature	3
HUP108	Environmental Ethics	3

Spring II Semester		
	Total Credits:	**14**

	SECOND YEAR	
Fall I Semester		**Credits**
SCB 265	Fundamentals of Ecology	4
MAT 200	Pre-calculus	4
CEP 121	Fundamentals of Professional Advancement	3
SSE 104	Introduction to Macroeconomics	3
Fall II Semester		
	Total Credits:	**14**

Spring I Semester		**Credits**
SCG 250	Environmental Science (capstone course)	4
SSN 202	Environmental Sociology	3
SCB 260	General Microbiology	4
Spring II Semester		
CEP 201	Internship	3
	Total Credits:	**14**

Environmental Science Curriculum

Counseling: 0 credits	
FSM 039 New Student Seminar	0
English: 6 credits	
ENG/ENC 101 English Composition I	3
ENG102 Writing Through Literature	3
Humanities: 3 credits	
HUP108 Environmental Ethics	3
Social Science: 6 credits	
SSE 104 Introduction to Macroeconomics	3
SSN 202 Environmental Sociology (Urban Studies)	3
Cooperative Education: 6 credits	
CEP 121 Fundamentals of Professional Advancement	3
CEP 201 Internship	3
Mathematics: 7 credits	
MAT 120 Elementary Statistics I (integrated with GIS)	3
MAT 200 Pre-calculus	4
Natural Sciences: 32 credits	
SCB 201 Fundamentals of Biology I	4
SCB 202 Fundamentals of Biology II	4
SCB 260 General Microbiology	4
SCC 201 Fundamentals of Chemistry I	4
SCC 202 Fundamentals of Chemistry II	4
SCG 150 Geographic Information Systems	4
SCB 265 Fundamentals of Ecology	4
SCG 250 Environmental Science (Capstone)	4
Total:	**60**

Appendix C:

SED BI: Program Contents and Requirements

Program Content and Requirements		Please place an x in the appropriate column		
	Course Number and Course Title*	No. of Credits	Is this a new course?	Is this a revised course?
Courses required for the college core	FSM000: New Student Seminar	0	No	No
	ENG101: Composition I: An Introduction to Expository Writing*	3	No	No
	ENG102: Writing through Literature*	3	No	No
	HUP108: Environmental Ethics* Critical Thinking	3	No	No
	SSE104: Introduction to Macroeconomics*	3	No	No
	SSN202: Environmental Sociology*	3	Yes	No
	CEP121: Fundamentals of Professional Advancement	3	No	No
	CEP201: Fulltime Internship	3	No	No
	MAT120 Elementary Statistics*	3	No	No
	MAT200: Pre-calculus*	4	No	No
Courses required For the major	SCB201: Fundamentals of Biology I*	4	No	No
	SCB202: Fundamentals of Biology II*	4	No	No
	SCB260: General Microbiology*	4	No	No
	SCB265: Fundamentals of Ecology*	4	Yes	No
	SCC201: Fundamentals of Chemistry I*	4	No	No
	SCC202: Fundamentals of Chemistry II*	4	No	No
	SCG150: Geographic Information Systems*	4	New	No
	SCG250: Environmental Science*	4	Yes	No
Total credits in the program		**60**		

** MOST UNDERGRADUATE DEGREE TITLES REQUIRE A SPECIFIED PERCENTAGE OF LIBERAL ARTS CONTENT (FOR EXAMPLE, AA, BA REQUIRE 75%; AS, BS, BSED REQUIRE 50%; AAS REQUIRES 33%). WITHIN THE TABLE, IDENTIFY WITH AN ASTERISK ALL COURSES THAT ARE CONSIDERED LIBERAL ARTS AND SCIENCES.*

GENERAL EDUCATION COURSES

FSM000 New Student Seminar
New Student Seminar is designed to provide an orientation for students to LaGuardia and to provide students with the knowledge and skills they need to be successful in college. Students will learn college policies and academic requirements, effective study skills, and test-taking strategies. In addition, students will engage in self and career exploration as well as academic planning and advisement.

ENG101 Composition I: An Introduction to Expository Writing
In this course students focus on writing as a process to create correct and effective expository essays in response to culturally diverse sources. Emphasis is placed on using various methods of organization appropriate to the writer's specific writing context. Students use a variety of rhetorical strategies, research methods, and documentation procedures in their essays. Admission to this course is based on college placement test scores.

ENG102 Composition II: Writing Through Literature
This course extends and intensifies the work of Composition I, including research methods and documentation procedures. Students are introduced to close-reading techniques to develop critical thinking and writing skills through the study of culturally diverse works in poetry and at least two other literary genres. Writing assignments include a critical research paper applying tools of literary analysis. Admission to the course requires completion of Composition I.

HUP 108 Environmental Ethics
This course offers students an opportunity to investigate ethical issues concerning the environment. The study of Environmental Ethics relates in complex ways to moral theory, as well as global issues in economics, politics and science. This course will explore such environmental questions and potential solutions as: Our personal responsibility for solving environmental problems; Health concerns, and our obligations to ourselves, each other and to the environment.

SSE104 Introduction to Macroeconomics
This course will examine what determines the aggregate level of economic activity. The levels of production, employment, and prices will be studied in relationship to aggregate expenditures. Institution arrangements of monetary and fiscal policy to address unemployment and inflation will also be covered.

CEP121 Cooperative Education: Fundamentals of Professional Advancement
This introductory Cooperative Education course will help students evaluate career and educational plans, develop professional literacy, and synthesize connections between coursework and professional opportunities. Theories of experiential learning and an overview of career planning will be introduced. Web-based activities, online reading and writing assignments and a pre-internship project will culminate in the development of a professional ePortfolio.

CEP201 Cooperative Education: Full-Time Internship
This internship provides students with an experience-based learning opportunity to: explore or confirm career interests and plans; Cooperative Education Department * Students are required to have at least a 2.0 cumulative grade
point average the semester prior to each internship semester and have completed the appropriate introductory and/or other prerequisite courses in their major; apply classroom learning to real work situations; and practice and strengthen interpersonal and technical skills. 25-40 hours per week at the internship site is required during the Co-op cycle. The internship is accompanied by a concurrent seminar that provides a framework for students to analyze their internship experience.

MAT120 Elementary Statistics I
This course serves as a study of fundamental concepts and computational techniques of elementary statistics. Among the topics studied are: measures of central tendency, standard deviation, percentiles, statistical graphs, binomial and normal distributions, probability, confidence intervals, hypothesis testing, regression and correlation. A statistical software package will be used by students to obtain basic sample statistics, to simulate fundamental theorems and to assist with hypothesis testing. A graphing calculator will be used by students to assist with computations, as well as with tabular and graphical displays of data.

MAT200 Precalculus
This course is intended as a preparation for the study of Calculus. Functions and their graphs will be analyzed theoretically within a framework that emphasizes their roles in applied settings. Particular attention will be placed on polynomial, exponential, logarithmic, and trigonometric models. The use of graphing utilities as analytical tools will be emphasized. Each student is required to have a graphing calculator.

SCB201 Fundamentals of Biology I
This course is an integrated two-semester laboratory-based sequence, stressing major concepts of biology designed to assist the student in relating these concepts to the environment. The scientific method of thinking and the experimental approach will be stressed. Among the topics studied are: SCB201: Cellular and molecular basis of life, heredity, and the evolution of life.

SCB202 Fundamentals of Biology II

This course is an integrated two-semester laboratory-based sequence, stressing major concepts of biology designed to assist the student in relating these concepts to the environment. The scientific method of thinking and the experimental approach will be stressed. Among the topics studied are: SCB202: Survey of the kingdoms, organismic anatomy and physiology with emphasis on the human system, the principles of ecology, and problems of population.

SCB260 General Microbiology
This course offers an introduction to microorganisms found in nature, industry, and disease. The student is introduced to virology, bacteriology, immunology, epidemiology, pathology and other related areas of microbial physiology. The laboratory will deal with the isolation and identification of common pathogenic and nonpathogenic organisms utilizing techniques of staining, culturing, fermentation reactions, and microscopic inspection.

SCC201 Fundamentals of Chemistry I
This is a two-semester sequence covering the basic concepts of chemistry and their historical development. The experimental nature of chemistry as well as the role of chemistry in many aspects of daily life are stressed. Among the topics studied are: SCC201: Atomic structure, chemical bonding, chemical reactivity, quantitative relationships in chemical reactions, thermochemistry, gases.

SCC202 Fundamentals of Chemistry II
This is a two-semester sequence covering the basic concepts of chemistry and their historical development. The experimental nature of chemistry as well as the role of chemistry in many aspects of daily life are stressed. Among the topics studied are: SCC202: Liquids, solids, solutions, acid-base theory, chemical kinetics, chemical equilibrium, chemical thermodynamics, electrochemistry, nuclear chemistry.

NEW COURSES

SSN 202 Environmental Sociology
This course examines sociological perspectives on the environment. It will explore how humans interact with and help to shape the environment. Special emphasis will be placed on the role that economics, politics, culture, science and technology play in urban environmental affairs. It will also apply basic sociological concepts such as social class, gender, race and ethnicity, inequality and conflict to environmental issues within urban settings.

SCG 150 Introduction to Geographic Information Systems
This course covers the entire Geographic Information Systems production process from data acquisition and modeling to editing, analysis and cartographic output. Lectures will introduce the theory of GIS science and laboratory classes will familiarize students with GIS software needed to accomplish the course objectives. The course will use data collected by students participating in the Newtown Creek analysis project, among other data sources, for a final mapping exercise.

SCB 265 Fundamentals of Ecology
This course is a comprehensive introduction to ecology. Students will be introduced to the kinds of questions asked
by ecologists, the principal concepts and theories that guide ecological inquiry and the methods that are used to answer ecological questions. Particular emphasis will be paid to population, community and ecosystem level processes and both terrestrial and aquatic systems will be considered. The practical component of the course will include laboratory exercises as well as field work.

SCG 250 Environmental Science
Environmental Science is the capstone course of the Environmental Science major. The course integrates
biological, chemical and physical concepts with service learning. Understanding the earth as a dynamic system
and addressing local environmental issues will be emphasized. Lab and field analysis of locally-collected water, soil and air samples will be conducted as part of a team research project.

ENVIRONMENTAL SCIENCE
PROGRAM SCHEDULING

Table for **quarter** programs

FALL I		FALL II		SPRING I		SPRING II	
COURSE TITLE	**CR.**	**COURSE TITLE**	**CR.**	**COURSE TITLE**	**CR.**	**COURSE TITLE**	**CR.**
New Student Seminar	0	Geographic Information Systems	4	Fundamentals of Biology II	4		
Fundamentals of Biology I	4			Fundamentals of Chemistry II	4		
Fundamentals of Chemistry I	4			Writing through Literature	3		
Composition I: An Introduction to Expository Writing	3			Environmental Ethics	3		
Elementary	3						

Statistics							
Total Credits	**14**	**Total Credits**	**4**	**Total Credits**	**14**	**Total Credits**	

FALL I		**FALL II**		**SPRING I**		**SPRING II**	
COURSE TITLE	**CR.**	**COURSE TITLE**	**CR.**	**COURSE TITLE**	**CR.**	**COURSE TITLE**	**CR.**
Fundamentals of Ecology	4			Environmental Science (capstone course)	4	Internship	3
Pre-calculus	4			Environmental Sociology	3		
Fundamentals of Professional Advancement	3			General Microbiology	4		
Introduction to Macroeconomics	3						
Total Credits	**14**	**Total Credits**		**Total Credits**	**11**	**Total Credits**	**3**

FACULTY

The following Professors are currently serving as full time faculty within their respective departments and will be part of the Environmental Science faculty. Each has strong skills in one or more of the disciplines to be covered in the Environmental Science program and have the qualifications necessary to teach the proposed new courses. We do not anticipate the need to hire any new full time faculty.

Sreedevi Ande, Ph.D. Profile

Dr. Sreedevi Ande has a PhD in Materials Engineering and Science. Her research interests are primarily in the area of Environmental Engineering and Science with an emphasis on environmental site characterization, contaminant fate and transport, contamination and remediation, materials characterization, water and wastewater treatment design, field investigations and statistical analysis, and project management. Dr. Ande has experience teaching different courses: Mathematics, Geology, Science, Environmental Science and Engineering courses at both high school and undergraduate level.

D. Priyantha Wijesinghe, Ph.D. Profile

Dr. Wijesinghe pursued his early education in Sri Lanka and in England and became interested in spiders, insects and other terrestrial invertebrates while an undergraduate in zoology at University College London (University of London) (1983). After a period of employment in Sri Lanka as a systematic entomologist, during which he studied the spider fauna of Sri Lanka, he did his Ph.D. with Norman Platnick at the City University of New York and the American Museum of Natural History (1997) on the relationships of basal groups in the spider family *Salticidae* (jumping spiders). His current projects include revisions of several tropical Asian jumping spider genera and jumping spider higher phylogeny. He is also interested in Indo-West Pacific biogeography. At LaGuardia Community College, he is involved primarily with teaching General Biology and is keenly interested in involving students in research, particularly in urban ecology.

Sarah Durand, Ph.D. Profile

Dr. Durand received a dual B.A./M.A. degree in the Division of Ecology and Evolution from the University of Pennsylvania under a special "submatriculation program" to the graduate school. Her undergraduate major in Marine Biology included a summer field course at the University's marine station in Maine. She developed a research project at the station into a Master's thesis concerning the foraging behavior of shore birds and its impact on intertidal zone fauna. Prior to pursuing her doctorate at Rutgers University, she taught Marine Ecology at one of New York City's elite high schools (The Fieldston School). Dr. Durand received Ph.D. in Neurobiology and Behavior from the Center for Molecular and Behavioral Neuroscience. Her post-doctoral work at the University of Maryland, College Park, was cited in "*Biological Psychology: An Introduction to Behavioral, Cognitive and Clinical Neuroscience"* by M. R. Rosenzweig, S. M. Breedlove and Arnold L. Leiman (2002). She is a member of the Avian Brain Nomenclature Forum, an international group of neuroscientists that has revised avian brain nomenclature to enable better cooperation across all researchers of vertebrate brain organization and function.

Steven Lang, Ph.D. Profile

Steve Lang received his PhD from the City University of New York Graduate Center after writing a dissertation on the political ecology of the emerging mariculture industry in New York. He taught Environmental Sociology at CUNY and has integrated environmental and sustainability issues into his urban studies courses at LaGuardia. Recently, he has been doing research on environmental sustainability and environmental justice issues on the New York City waterfront. He recently received a PSC-CUNY grant to explore how community groups negotiate issues of economics growth, social equity and environmental concerns as they struggle to clean up Newtown Creek, a 3.5 mile, highly polluted industrial waterway that is located in Queens, next to LaGuardia Community College.

Thomas J. Bruckman Profile

Thomas Bruckman has been teaching computer courses at LaGuardia since 1999. He has been using MapInfo Geographic Information System software to complete various projects at Con Edison. After the Manhattan steam explosion in 2007, he created a boundary map of the geographical area affected by the steam explosion which enabled him to plot the location of the affected residential and commercial customers. Additionally, he assisted in the development of a new Web based mapping application known as the Area Profile System. This system enables the user to compare and view several data elements at one time for a particular geographical area. For example, it is possible to view a street map with a transparent layer showing zip code boundaries and an additional transparent layer showing population density. This application has become a major company resource used in connection with electric, gas and steam emergencies. Mr. Bruckman received a Con Edison "Team Award" for this project.

FACILITIES

The department of Natural Sciences currently has five biology laboratories and two large preparation rooms to support the teaching of General Biology, Anatomy and Physiology and General Microbiology. One additional biology laboratory with prep area is under construction funded by funds from Project Promesa (Promoting Math Excellence and Science Access) and a Title V grant from the Department of Education to enhance the quality of STEM education at Hispanic-serving institutions. This lab will be completed by august 2010. Environmental Science and Ecology laboratories will be taught inone of the six instructional laboratories.

To provide laboratory study space for science students, a 1700 sq. ft. space was re-fitted to provide supervised tutorial space. Students have access to models, preserved material, computers and specially trained tutors to support their lab experiences.

Faculty and undergraduate research will be done in a 1700 sq. ft. Faculty Research Area. This complex of three rooms is undergoing renovation now and will be completed by September 2010. This Faculty Research Area will house the scanning electron microscope, phase contrast microscope, -80°C freezer, cell culture wood, etc. Funding for the renovation of their area was from Project Promesa and CUNY.

COST ASSESSMENT

Funds from the 1.8 million dollar Title V Grant, Project Promesa, will be used to purchase equipment to support the science laboratory component of the three new science courses, Geographic Information systems, Fundamentals of Ecology and Environmental Science. The funds will support the equipment upgrade to two existing general biology labs, for a total of $50,000.00. An additional $130,000.00 will fund a Mobile Field lab,

which will allow students in the Environmental Science program to conduct field studies throughout the New York City area. The grant will also support the Faculty Research Lab, where students will be assigned as part of their internship experience. Students will work alongside faculty in support of Environmental Research conducted on campus and within Long Island City area at Newtown Creek.

During the past two years, the Department of Natural Sciences and the Department of Mathematics have hired several new faculty who have diverse backgrounds. The new curriculum will be incorporated into their standard teaching workload, without the need to hire new "specialized" faculty. The costs can then be calculated at the faculty replacement rate of approximately $1200/course hour. At a class size of 30 students, in the first year this will result in approximately 60 additional contact hours or $72,000. In the second year, the cost will increase to approximately $216,000. Part of these costs will be defrayed through Title V activities and tax levy reimbursement for Full Time Equivalents (FTE). FTE is estimated to be reimbursable at $2800/FTE. Table II provides an overview of faculty and staff costs.

TABLE II

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Student Cost	**(72,000)**	**(216,000)**	**(288,000)**	**(288,000)**	**(288,000)**
FTE Reimbursement	**168,000**	**448,000**	**560,000**	**560,000**	**560,000**
Total	**96,000**	**232,000**	**272,000**	**272,000**	**272,000**

By year 2, the projected surplus will be sufficient to cover the cost of additional laboratory staff and supplies.

OUTCOMES ASSESSMENT

The Department of Natural Sciences will assess the effectiveness of the Environmental Science Program by utilizing the College's outcome assessment process. An assessment grid will be developed for the program that outlines the work from each course that must be deposited into the ePortfolio for assessment of the College's five competencies (critical literacy, quantitative reasoning, oral communication, research and information literacy and technological literacy).

The Natural Science Faculty will develop a set of programmatic competencies to ensure students are graduating with the knowledge and skills necessary for an Environmental Science major. A rubric will be created to assess student development towards achieving these outcomes.

Finally, the Department of Natural Sciences will work closely with the Office of Transfer Services to track the students transferring to senior colleges. As needed, alumni and employer surveys will be done.

ARTICULATION AGREEMENT

LaGuardia Community College has entered into discussions with the School of Earth and Environmental Science at Queens College for the purpose of articulation. (See letter and preliminary proposal in **Appendix B**). It is our intention also to approach York College in order to articulate with their Environmental Health Science program, which has a Life Science emphasis. Students entering our program will receive orientation on transfer and their career potential through our Counseling Department and Transfer Center.

APPENDIX A

Student Questionnaire and Results

QUESTIONNAIRE

1. Have you already completed some math or science courses? (yes, no) circle one.
   If you answered **YES,** please list the most recent ones you've taken.

   _____

2. Have you been thinking about a career in science? **(yes, no) circle one**
   If so, which one? _____

3. Are you interested in exploring a career in Environmental Science? **(yes, no) circle**

4. If LaGuardia were starting the program this Fall 2008, would you consider enrolling in it? **( ) Answer 1 through 5 with 1= not at all likely to 5= very likely**

5. If you are interested in any way, which academic pathway would you be most likely to follow? **(check one)**
   ___ A.S. degree program and then work
   ___ A.S. degree program and then B.S. at Queens College
   ___ transfer to Queens without completing the A.S. degree

6. Which of the following is the most important reason for your choosing a career in this field?
   __ salary
   __ interested in science
   __ likelihood of jobs
   __ room for rapid advancement
   __ want to help the environment

7. Would you come to a discussion that further describes the Environmental Science Program here at LaGuardia? **(yes, no) circle one**

8. Would you be interested in receiving more information by Email? (yes, no) circle one. If so, please print your Email address so we can contact you.
   _____

APPENDIX B

New Course Syllabi

Appendix B:
Syllabi for New Courses

ENVIRONMENTAL SOCIOLOGY

Course ID: SSN 202
Course Title: Environmental Sociology
Department: Natural Sciences
Discipline: SSN Environmental Science
Course Credits: 3 credits 3 lecture hours

Required Textbooks: **An Invitation to Environmental Sociology;** Bell, Michael Mayerfield 3rd Ed. 2009 (ISBN: 978-1-4129-5655-0); Publisher: Pine Forge Press

Twenty Lessons in Environmental Sociology; Gould, Kenneth J. and Lewis, Tammy L. 1st Ed. 2009 (ISBN: 9780195371123); Publisher: Oxford Univ. Press

Environmental Sociology: A Social Constructionist Perspective; Hannigan, John 2nd Ed. 2008 (ISBN: 9780415355124); Publisher: Routledge

Environmental Sociology: From Analysis to Action; King, Leslie and McCarthy, Deborah 2nd Ed. 2009 (ISBN: 9780742559097); Publisher: Roman and Littlefield, Inc.

Volatile Places: A Sociology of Communities and Environmental Controversies; Gunter, Valerie and Kroll-Smith, Steve 1st Ed. 2007 (ISBN: 0761987509); Publisher: Pine Forge Press

Noxious New York; Sze, Julie 1st Ed. 2007; (ISBN: 9780262693424); Publisher: MIT Press

Prerequisite: CSE 099, ENG 099, MAT 095

Course Description: This course examines sociological perspectives on the environment. It will explore how humans interact with and help to shape the environment. Special emphasis will be placed on the role that economics, politics, culture, science and technology play in urban environmental affairs. it will also spply basic sociological concepts such as social class, gender, race and ethnicity, inequality and conflict to environmental issues within urban settings.

Prerequisite:

Grading:

Class Participation	10%
3 Writing Assignments	15%
Midterm Exam	25%
Research Paper	25%
Final Examination	25%

100%

INSTRUCTIONAL OBJECTIVES:

1. Introduce students to the basic concepts and theoretical perspectives underlying environmental sociology.
2. Enable students to apply concepts and theoretical perspectives to urban environmental issues.
3. Familiarize students with major issues and debates in environmental sociology.
4. Enable students to define and apply the fundamental sociological concepts such as social inequality, social structure, culture, power, and social interaction to environmental issues and concerns.
5. Familiarize students with environmental social movements, especially urban ones.
6. Provide the students with knowledge and skills necessary to undertake an in-depth, case study research project on a particular urban environmental issue.
7. Reinforce core concepts through two out-of-classroom, hands-on experiences.
8. Enable students to fulfill WID and ePortfolio requirements.

PERFORMANCE OBJECTIVES:

1. Identify the basic theoretical perspectives used to explain human-environment interactions and the assumptions underlying them.
2. Identify and explain the interconnections between social systems and ecosystems in assorted settings, especially urban ones.
3. Identify and describe major issues and debates within the field of environmental sociology.
4. Describe general sociological concepts as social inequality (especially social class, gender and race), power, culture social structure and social interaction and apply them to environmental concerns and issues.
5. Interpret and analyze classic and contemporary essays and articles on environmental social movements, especially urban ones.
6. Conduct research on the sociological dimension of a particular environmental issue and write a research paper.
7. Describe, in writing, how core concepts are illustrated in specific hands-on experiences.
8. Demonstrate WID competencies and submit an assignment to ePortfolio.

LECTURE OUTLINE:

Week 1: Introduction to Environmental Sociology
Week 2: The Rise of Environmental Politics and the Environmental Movement
Week 3: Consumer Culture and the Environment
Week 4: Political Economy and the Environment
Week 5: Population and Development
Week 6: Urban Environmentalism
Week 7: Science, Technology and Risk
Week 8: Environmental Justice: Race, Class and Gender

Week 9: Globalization and Urbanization
Week 10: Cities and the Politics of Sustainability
Week 11: Corporate Responsibility
Week 12: From Theories to Practice: Working for Environmental Change
Week 13: Final Exam

Appendix B:
Syllabi for New Courses

FUNDAMENTALS OF ECOLOGY
Course ID: SCB265
Course Title: Fundamentals of Ecology
Department: Natural Sciences
Discipline: SCB-Biology
Course Credits: 4 credits 6 hours (3 lecture, 3 laboratory)

Required Textbooks: **Elements of Ecology;** Smith, Thomas M. & Smith, Robert Leo; 7th Ed. 2009 (ISBN: 978-0-321-55957-9); Publisher: Pearson Benjamin Cummings
Ecology on Campus; Kingsolver, Robert W.; 2006 (ISBN: 0-8053-8214-3); Publisher: Pearson Benjamin Cummings

Prerequisite: SCB202, SCC202

Course Description: This course is a comprehensive introduction to ecology. Students will be introduced to the kinds of questions asked by ecologists, the principal concepts and theories that guide ecologicalinquiry and the methods that are used to answer ecological questions. Particular emphasis will be paid to population, community and ecosystem elvel processes and both terrestrial land aquatic systems will be considered. The practical component of the course will include laboratory exercises as well as field work.

Prerequisite:

Grading:		
	3 Lecture Exams at 10% each	30%
	Lecture Final Exam	20%
	4 Lab Quizzes at 5% each	20%
	Lab Reports	10%
	Project and ePortfolio	10%
	Lab Final Exam	10%
		100%

INSTRUCTIONAL OBJECTIVES:

1. Introduce students to the scope of ecology and the levels at which interactions between organisms and their environment can be studied.
2. Familiarize students with factors affecting temperature and precipitation.
3. Reinforce students' knowledge of the water cycle and the properties of water that determine the nature of aquatic environments.
4. Introduce students to the characteristics and formation of soil.
5. Reinforce students' knowledge of evolutionary theory and basic population genetics in relation to ecology.
6. Develop the concept of morphological and physiological adaptations of plants and animals to their environment.
7. Familiarize students with life history patterns and properties of populations and introduce students to population growth under the exponential and logistic models
8. Introduce students to various types of species interactions, including interspecific competition, predation and symbiosis (parasitism and mutualism).
9. Introduce students to community structure and community dynamics, including succession in plant communities.
10. Reinforce students' understanding of ecosystem energetics and trophic interactions, including decomposition and nutrient recycling.
11. Familiarize students with the biogeochemical cycles.
12. Introduce students to terrestrial and aquatic ecosystems.
13. Familiarize students with the concept of biodiversity and factors contributing to biodiversity.
14. Provide students with an understanding of factors affecting human population growth and the impact of population growth on resource use.
15. Provide students with case studies of natural habitat and biodiversity loss and emphasize the importance of conservation.

PERFORMANCE OBJECTIVES:

1. Describe the scope of ecology and the levels at which interactions between organisma and their environment can be studied.
2. Identify factors affecting temperature and precipitation.
3. Describe the water cycle and explain how the properties of water determine the nature of aquatic environments.
4. Describe the characteristics of soil and explain how soil is formed.
5. Explain the relationship of population genetics and evolution with respect to ecology.
6. Compare and contrast the morphological and physiological adaptin of plants and animals to their environment.
7. Describe life history patterns and properties of populations and compare and contrast population growth under the exponential and logistic models.
8. Describe types of species interactions and compare and contrast interspecific competition, predation and symbiosis (parasitism and mutualism).

9. Explain community structure and community dynamics, including succession in plant communities.
10. Define ecosystem energetics and trophic interactions and describe decomposition and nutrient recycling.
11. Describe the biogeochemical cycles.
12. Compare and contrast different types of terrestrial and aquatic ecosystems.
13. Define biodiversity and describe the factors that contribute to biodiversity.
14. Identify factors affecting human population growth and the impact of population growth on resource use.
15. Analyze case studies of natural habitat and biodiversity loss and explain the importance of conservation.

LECTURE OUTLINE:

Week 1:	Introduction to ecology; climate; the aquatic environment
Week 2:	The terrestrial environment; ecological genetics
Week 3:	Plant adaptations to the environment; animal adaptations to the environment; life history patterns
Week 4:	Properties of populations; population growth; Exam 1
Week 5:	Population growth (continued); intraspecific population regulation; metapopulations
Week 6:	Interspecific competition; predation
Week 7:	Parasitism and mutualism; community structure; Exam 2
Week 8:	Factors influencing the structure of communities; community dynamics: succession; landscape ecology
Week 9:	Ecosystem energetics; decomposition and nutrient recycling; biogeochemical cycles
Week 10:	Terrestrial ecosystems; aquatic ecosystems Exam 3
Week 11:	Coastal and wetland ecosystems; large-scale patterns of biological diversity
Week 12:	Habitat loss, biodiversity and conservation.
Week 13:	Final Exam

LABORATORY OUTLINE:

Week 1:	Aquatic environments: dissolved oxygen and temperature; sediment load and water clarity
Week 2:	Physical properties of soils; soil pH in two microhabitats
Week 3:	Describing a population: seed weight in legumes; needle length in conifers; Quiz 1
Week 4:	Spatial distribution of populations; demography: life tables
Week 5:	Population growth: population growth in yeast
Week 6:	Competition: allelopathy; Quiz 2
Week 7:	Field trip: community structure in an aquatic ecosystem: salt marsh
Week 8:	Mutualism: microbial symbionts in termite gut, lichen
Week 9:	Field trip: community structure in a terrestrial ecosystem; Quiz 3
Week 10:	Succession
Week 11:	Energy flow: productivity of plankton; project presentations; Quiz 4

Week 12: Biodiversity: measuring invertebrate biodiversity; project presentations
Week 13: Lab final exam

Appendix B:
Syllabi for New Courses

ENVIRONMENTAL SCIENCE
Course ID: SCG250
Course Title: Environmental Science
Department: Natural Sciences
Discipline: SCG Environmental Science
Course Credits: 4 credits 6 hours (3 lecture, 3 laboratory)

Required Textbook: **The Earth System** Kump, LR; Kasting, JF; Crane, RG 3rd Ed. 2010 (ISBN-10: 0321597796), Publisher: Prentice Hall

Prerequisite: ENG101, SCG150 (GIS), MAT200

Course Description: Environmental Science is the capstone course of the Environmental Science major. The course integrates biological, chemical and physical concepts with service learning. Understanding the earth as a dynamic system and addressing local enviornmental issues will be emphasized. Lab and field analysis of locally-collected water, soil and air samples will be conducted as part of a team research project.

Prerequisite:

Grading:		
	4 lecture quizzes	20%
	Midterm & Final Exams	30%
	Lab Notebook	10%

Lab Practical Exam	10%
Research Project	25%
ePortfolio Presentation	5%
	100%

INSTRUCTIONAL OBJECTIVES:

1. Introduce primary source literature in environmental science.
2. Develop a quantitative understanding of energy flow and cycles of elements.
3. Introduce global circulation patterns in the oceans and atmosphere with reference to underlying physical and chemical processes.
4. Introduce concepts of biomes and the biosphere by reinforcing the concept of the ecosystem.
5. Introduce climate change within the context of natural organic and inorganic carbon cycles.
6. Introduce techniques and equipment for acquisition and analysis of environmental data and apply these to the surrounding community.
7. Reinforce techniques of data recording and analysis with Geographic Information Systems (GIS) and statistics software using environmental data collected from the local community.
8. Enable student engagement with interested parties of the community - commercial, residential or governmental - with interviews and data-sharing.
9. Introduce the different positions on local environmental issues held by government agencies, residential associations and businesses.
10. Reinforce critical thinking in written and oral communication.
11. Familiarize students with how to present their research findings and conclusions in the form of a scientific paper.

PERFORMANCE OBJECTIVES:

1. Analyze primary source literature in environmental science.
2. Describe energy flow and cycles of elements with quantitative analysis.
3. Explain global circulation patterns in the oceans and atmosphere with reference to underlying physical and chemical processes.
4. Identify the common characteristics of ecosystems that share the same biome and explain biome distribution within the biosphere.
5. Analyze climate change within the context of natural organic and inorganic carbon cycles.
6. Collect and analyze water, soil and air samples within the surrounding community to identify environmental conditions that require remediation.
7. Use GIS and statistics software to record and analyze environmental data collected from the local community.
8. Engage interested parties of the community-commercial, residential or governmental-in order to receive commentary and share data.
9. Articulate the different positions on major environmental issues held by government agencies, residential associations and businesses.
10. Demonstrate critical thinking in written and oral communication.
11. Present research findings and conclusions in the form of a scientific paper.

LECTURE OUTLINE:

Week 1: Global change: short and long time scales and concepts of systems, feedback and equilibrium

Week 2: Energy balance, atmospheric structure and the "greenhouse effect"

Week 3: Atmospheric circulation, global weather and the hydrologic cycle (quiz #1)

Week 4: Ocean structure and circulation patterns

Week 5: Oceanic oscillation events and deep ocean circulation (quiz #2)

Week 6: Geologic structure, composition and weathering

Week 7: The biosphere: organisms, ecosystems, biomes and an introduction to carbon cycles (Midterm exam)

Week 8: Biosphere-atmosphere interactions.

Week 9: Long-term climate regulation and glaciation (quiz #3)

Week 10: Carbon cycling in depth: organic cycles, inorganic cycles and disrupted equilibruim - the burning of fossil fuels

Week 11: Global warming and its effects (quiz #4)

Week 12: Remedies for global warming

Week 13: Final exam

LABORATORY OUTLINE

Week 1:
1. Introduction to the capstone integrated learning project.
2. Introduction to sampling techniques and the requirement of standard methods.
3. Requirements for the lab notebook.

Week 2:
1. Discussion of local environmental problems.
2. Organizing into research teams of 3-4 students; each team schedules an appointment with appropriate professor to discuss research strategy.
3. Use of water analysis equipment.

Week 3:
1. Research teams orally present outline of research project and receive assistance in team member assignments (30min).
2. Water sampling, testing and analysis: on-site and lab.

Week 4:
1. Introduction to the Elemental Analyzer.
2. Research teams orally present final project design (Research team presents written outline of project, including time-line).

Week 5:
1. Soil sampling, testing and analysis: on site and lab.
2. Research teams meet to work on project.

Week 6: Introduction to gas chromatography and “badge” sampling for air-born contaminants (lab notebooks submitted).

Week 7:
1. Research teams orally present progress reports and receive class feedback.
2. Research teams meet for data collection, testing and/or analysis (Written weekly progress report submitted by one team member).

Week 8:
1. Press reports (as for week7).
2. Research teams meet (as for week7) (Written weekly progress report submitted by a second member of each research team).

Week 9:
1. Progress reports (as for week7).
2. Research teams meet (as for week 7) (Written weekly progress report submitted by a third member of each research team).

Week 10: Practical exam: students demonstrate use and understanding of analytical equipment.

Week 11:
1. Progress reports (as for week7).
2. Research teams meet (as for week7) (Written progress report submitted by either the fourth team member or the group).

Week 12: Oral presentations of research projects.

Week 13: Students submit a corresponding written report and an ePortfolio record of their work on the team research project.

Appendix B:
Syllabi for New Courses

ENVIRONMENTAL SCIENCE
Course ID: SCG150
Course Title: Introduction to Geographic Information Systems
Department: Natural Sciences
Discipline: SCG Environmental Science
Course Credits: 4 credits 6 hours (3 lecture, 3 laboratory)

Required Textbooks: **Key Concepts and Techniques in GIS**; Albrecht, J. 2007 (ISBN:978-1-4129-1016-3); Publisher: Sage Publications, Inc.
Getting to Know ARC GIS Desktop-updated for ARC GIS 9.3; Ormsby, Et Al; 2nd Ed. 2008; (ISBN: 9781589482104); Publisher: ESRI Press

Geospatial Analysis Free Access at: http://www.spatialanalysisonline.com
De Smith, M Et Al; 2008

Prerequisite: MAT 096

Course Description: This course covers the entire Geographic Information Systems production process from data acquisition and modeling to editing, analysis and cartographic output. Lectures will introduce the theory of GIS science and laboratory classes will familiarize students with GIS software needed to accomplish the course objectives. The course will use data collected by students participating in the Newtown Creek analysis project, among other data sources, for a final mapping exercise.

Prerequisite: ENG 101

Grading:	4 Lecture Exams @15% each	60%
	2 Lab Exams @ 10% each	20%
	5 Lab Worksheets @ 2% each	10%
	Research Project & Presentation	10%
		100%

INSTRUCTIONAL OBJECTIVES:
1. Introduce students to GIS data sources, terminology and components.
2. Familiarize students with the use of GIS in ecology, sociology and business with respect to environmental science.
3. Introduce students to key concepts of GIS data management.
4. Provide the student with an understanding of spatial data, geographic databases, geoprocessing and modeling.
5. Introduce students to GIS analysis through the use of data collected from local sources.
6. Introduce students to criteria used to choose a GIS package and to obtain and evaluate GIS data.
7. Familiarize students with ARC GIS software.
8. Reinforce oral and written skills.
9. Introduce students to GIS career options.

PERFORMANCE OBJECTIVES:
1. Explain GIS data sources, terminology and components.
2. Compare and contrast the use of GIS in ecology, sociology and business with respect to environmental science.
3. Demonstrate key concepts of GIS data management.
4. Analyze spatial data and geographic databases
5. Perform GIS analysis of data collected from local sources.

6. Define the criteria used to choose a GIS package and to obtain and evaluate GIS data.
7. Use ARC GIS Software.
8. Demonstrate oral and written skills.
9. Compare and contrast GIS career options.

LECTURE OUTLINE:

Week 1: Introduction to GIS; course overview; project management
Week 2: Cartographic communication and geospatial visualization
Week 3: Geodetic datums; projections and coordinate systems
Week 4: Organizing geographic data; Exam #1
Week 5: Creating and editing spatial data; secondary data sources and geocoding
Week 6: Exploring the geodatabases model; creating geodatabases
Week 7: Creating and editing features in geodatabases; Exam #2
Week 8: Geoprocessing and modeling
Week 9: Getting started with Raster-based GIS analysis
Week 10: Interpolation and surface modeling; Exam #3
Week 11: Cartographic design
Week 12: Data quality; social aspects and applications of GIS
Week 13: Exam #4

LABORATORY OUTLINE:

Week 1: Introduction to ARC GIS Desktop
Week 2: Maps and Data; Exploring ARC Map and ARC Catalog
Week 3: Querying Data; preparing data for analysis; managing data with ARC Catalog
Week 4: Data display in ARC Map; Lab worksheet #1
Week 5: Analyzing feature relationships; analyzing spatial data
Week 6: Building geodatabases; Lab Exam #1; Lab worksheet #2
Week 7: Creating features; editing features; Lab worksheet #3
Week 8: Geocoding addresses; Lab worksheet #4
Week 9: Making maps from templates; Lab worksheet #5
Week 10: Modeling
Week 11: Research Project Presentations
Week 12: Research Project Presentations continued
Week 13: Lab Exam #2

Articulation Agreement

Appendix H:
Articulation Agreement with Queens College
Associate in Science (AS) in Environmental Science Articulation Agreement

Sending College: LaGuardia Community College (LAGCC)
Department: Natural Sciences
Program: Environmental Science
Degree: Associate in Science, Environmental Science

Receiving College: Queens College (QC)
Department: Biological Sciences
Program: Earth and Environmental Science
Degree: Bachelor of Science, Earth and Environmental Science

Admittion requirements for senior college program
Transfer students need a 2.0 GPA – 12 or more credits.

Total transfer credits granted toward the baccalaureate degree:
60

Total additional credits required at the senior college to complete baccalaureate degree:
60

COURSES TO BE TAKEN AT LAGUARDIA

Prerequesite and Major Courses

SCB 201	Fundamentals of Biology I	4	Bio 105	General Biology: Life Forms, Evolution and Ecosystems	4
SCB 202	Fundamentals of Biology II	4	Bio 106	General Biology: Physiology and Cell Biology	4
SCB 260	General Microbiology	4	ENSCI 203	Environmental Microbiology	4
SCC 201	Fundamentals of Chemistry I	4	Chemistry 113	General Chemistry I	4
SCC 202	Fundamentals of Chemistry II	4	Chemistry 114	General Chemistry II	4
SCG 150	Geographic Information Systems (GIS)	4	GEOL 383	Geographic Info. Systems	4
SCB 265	Fundamentals of Ecology	4	Science Elective for BS-Biology 340	Ecology	4
SCG 250	Environmental Science (Capstone course)	4	Environmental Science 100 (ENSCI 100)	Our Planet in the 21st Century: Challenges to Humanity	4
SUBTOTAL		32	SUBTOTAL		32

Articulation Agreement
LaGuardia Community College & Queens College
(Environmental Science Major)

GENERAL EDUCATION

Course #	Course Title	Crs	QC equiv.	Course Title	Crs
FSM 039	New Student Seminar	0	None		0

ENG/ENC 101	English Composition I	3	ENG 110	College Writing	3
ENG102	Writing Through Literature	3	ENG 120	Writing, Literature and Culture	3
HUP 108	Environmental Ethics	3		Elective Credits	3
SSE 104	Introduction to Macroeconomics	3	ECON 101	Introduction to Macroeconomics	3
SSN 202	Environmental Sociology (Urban Studies)	3		Elective Credits	3
CEP121	Fundamentals of Professional Advancement	3		Elective Credits	3
CEP 201	Internship	3		Elective Credits	3
MAT 120	Elementary Statistics I (integrated with GIS)	3	MAT 114	Elementary Probability and Statistics	3
MAT 200	Pre-calculus	4	MAT 122	Pre-calculus	4
SUBTOTAL		28	SUBTOTAL		28
TOTAL CREDITS TRANSFERRING TO QUEENS COLLEGE					**60**

Courses to be taken at Queens College
Major Discipline Requirements (B.S. Degree)

COURSE		CREDITS
MATH 151	Calculus I	4
MATH 152	Calculus II	4

GEO 102	Historical Geology	3
PHYS 121	General Physics I	4
PHY 122	General Physics II	4
ENSCI 200	Earth Systems Science	3
GEOL 208	Surficial Processes	3
GEOL 216	Dynamics of Oceans & Atmosphere	3
GEOL 318	Soils in the Environment	3
GEOL 342	Meteorology & Climate	3
GEOL 349	Environmental Geology	3
BIOL 340	Ecology	3
ENSCI 373	Environmental Problem Solving	3
	Subtotal	*43*
General Education Requirement Remainder of Credits as Free Electives		17
	Total	***60***
Queens College	Total Credits	60
LAGCC	Total Credits	60
BS Degree	**TOTAL CREDITS**	**120**

Procedures for reviewing, updating, modifying or terminating agreement:

LAGCC's Science Faculty will annually review core curriculum courses in the Environmental Science major. Any changes in curriculum will be forwarded to the science designee at Queens College for review and comments. All changes in curriculum will be mutually agreed upon in order to maintain course transferability between LAGCC

and Queens College. Termination of the articulation agreement must be agreed upon by both LAGCC and Queens College.

Procedures for evaluating agreement, e.g., tracking the number of students who transfer under the articulation agreement and their success:

LAGCC's Science Faculty will work with the Transfer Services Office to identify students in the Biology Major who transfer to Queens College. The science designee at Queens College will track the students and inform LAGCC of their progress towards degree completion.

Sending and receiving college procedures for publicizing agreement, e.g., college catalogs, transfer advisers, Websites:

LAGCC will advertise this articulation agreement through the Transfer Services Office, as well as, at LAGCC recruitment events, in the college catalog, on the College's website, and on www.celltalks.org.

Additional Information:

The three credits earned for CEP 121 at LAGCC will transfer to Queens College as three elective credits only if the student has earned the AS in Environmental Science Degree from LAGCC before transferring to Queens College.

Effective Date: September 2010

_____	_____
Signature of Sending College Peter Katopes, Ph.D. Vice President for Academic Affairs	Signature of Receiving College James R. Stellar, Ph.D. Provost and Vice President for Academic Affairs
_____	_____
Signature of Sending College John P. Bihn, Ph.D. Chairperson Department of Natural Sciences	Signature of Receiving College Allan Ludman, Ph.D. Chairperson School of Earth and Environmental Sciences