Hostos Community College

Department of Mathematics

Academic Program Review (APR)

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INTRODUCTION

In the fall of 2011 the Mathematics Department of Hostos Community College initiated its Academic Program Review process. At that time the chairperson of the Department selected Professor Loreto Porte to lead this effort. The process followed was a strong and an inclusive one, in which every member of the Department had the opportunity to contribute.

While this report is certainly a team product, Chairperson Daniel Maysonet and Professor Loreto Porte would like to thank the special efforts of professors W. Baker, A. Cunningham, R. Flek, J. Kennis, and O. Dias. Their regular and sustained support was essential for the completion of this document.

In this introduction the Department would like to briefly summarize the context of its work as well as its strengths, its concerns, and its vision for the future.

A. Our Students

The majority of Hostos students come from the South Bronx. They constitute a rich racial and ethnic mix facing serious economic and educational challenges in their pursuit of higher education. 75% of all entering students require remediation in mathematics and approximately one third require remediation in reading and writing as well. Although the pass rates on the CUNY basic skills tests following remedial courses remain an issue for the college, given that Hostos accepts the least prepared students in CUNY with the highest levels of remedial/developmental needs, the results are impressive.

B. Our Faculty

The major strength of the Department lies in its faculty and their commitment to our students. This is a diverse and well prepared cadre of professionals who are both able and willing to confront the challenges that our unique student population presents. As reflected in this study, the faculty is an experienced one, with a strong commitment to teaching and a long service to the institution.

As evidenced by the list of grants awarded in the period of this study, as well as by a substantial number of publications, presentations at national and international conferences and awards received, the faculty of the Department keeps abreast of the developments in their fields of expertise.

C. Accomplishments

Mission, Goals, and Objectives: Because of the three new STEM programs, the Department no longer performs solely a service function. Accordingly, the department has revised its mission,

goals, and objectives. These changes, as reported in this study, are the ones informing the work of the Department.

Curriculum and Pedagogy: It is in the area of curriculum where the progress of the Department is most notable. During the period covered by this study, substantial curricular revisions have been made by the Department. At this moment, all courses in the Department have clearly stated learning outcomes, new courses have been created—including an Honors Calculus course and a special course designed for Allied Health students—some courses have been converted to a hybrid or asynchronous mode, and new programs have been established.

While the developmental students are close to the College's mission and a focus of attention of the Department, we also pride ourselves on having developed three new STEM pathways for students interested in pursuing careers where mathematics is an essential component. These pathways have resulted in a significant increase in the number of students interested in advanced mathematics courses.

Many different approaches to teaching and supporting students have been explored during the period covered by this study. The implementation of supplemental instruction and the extensive use of different technologies to improve the success of our students are the most relevant. Studies conducted by faculty within the Department show that these types of intervention benefit students in a significant way.

Assessment: This is the second area in which the Department has concentrated its efforts. In terms of assessment, the past two years have been a time for reflection, discussion, planning, and implementation. As reflected in this study, the Department has reached a high level of understanding of the importance of assessment. This understanding has informed the work done to start the process of course assessment.

The Department has developed Student Learning Outcomes (SLO's) for all courses and started the process of developing uniform departmental midterm and final exams that match the established SLO's. The Department conducted an item analysis study for two of our developmental courses—MAT 010 and MAT 020. The results demonstrated several areas of student weakness. The respective committees for these two courses have been charged with making recommendations to the Department about possible interventions that will improve students' performance as well as what further analyses might be appropriate.

Also in terms of assessment, the Department has been analyzing the past and current trends on the performance, retention, and exit from remediation of our students. While, during the period covered by this study, the collected data show positive progress in all these areas, the improvement of all these indicators continues to be a challenge.

D. Areas of Concern and Recommendations

STUDENT SUPPORT

A major area of concern for the Department lies in the area of student support through tutorial services. The Department has no pedagogical, curricular or qualitative control of the mathematical tutorial services provided at Hostos.

Workshops for developmental students are conducted by tutors and are not under the supervision of the Department. Sometimes these workshops are offered during the semester, and they interfere with student progress in a regular class. Presently, the Department is attempting to conduct workshops for high-level repeaters.

The structure of developmental courses includes 4.5 hours of instruction by a faculty member and 1.5 hour recitation session conducted by a tutor. During the past three years not all sessions of the developmental courses have been assigned a tutor for the recitation sessions. Therefore; these sessions lack 1.5 hours of in-class student support.

Recommendation

A full-time coordinator for Mathematics tutorial services should be hired. This coordinator should be hired by and be responsible to the Department. According to the plans for the future, if the Department pursues the implementation of supplemental instruction (SI) for the developmental courses, the coordinator of tutorial services will also serve as the SI coordinator.

In order to better serve our evening students and faculty, the Department should have two deputy chairs and better secretarial support.

REMEDIATION

The pass rates on the CUNY basic skills tests following remedial courses remain an issue for the college. However; given that Hostos accepts the least prepared students in CUNY with the highest levels of remedial/developmental needs, the results are impressive. While much progress has been made in this area, the improvement of passing, retention, and exit rates from remediation continues to be a challenge and an area of concern.

Recommendation

Several studies which have been conducted within the department show that some interventions—e.g. in-class tutorial support and the use of technology in instruction—do have a positive impact on students' retention, passing grades and exit rate from remediation. Support for the implementation of these interventions on a larger scale is needed.

To provide support for developmental students that are not doing well in a class, the Department should implement special intervention for those students that fail the midterm exam.

New ways to support developmental students should be explored. A priority in this area should be the implementation of SI.

Special attention should be given to the pilot course that the Department will be offering during fall 2013. This is an accelerated course with study skills support that will prepare students to exit from remediation in one semester.

ASSESSMENT

Although the assessment process has begun at the developmental level, the Department needs to strengthen a culture of assessment in teaching throughout all of our course offerings. Addressing the needs of our remedial mathematics students through this assessment process is a critical component of the Department's future endeavors.

Recommendations

To allow for real intervention before the next academic review, the course assessment cycle should be completed every two years.

New ideas and methodology need to be developed and implemented to address identified student weaknesses. The Department should conduct seminars and further research that focus on the type of interventions that might be put into class practice.

The cycle of assessment, as described in this study, and the design of new ideas based upon best practice and educational research need to be extended to college level mathematics courses as well.

The process of assessment also needs to be extended to include the assessment of the STEM programs under the Department. We need to encourage more STEM majors and find new partners for our programs. New programs should be developed including a Computer Science program.

THE VALUE OF TEACHING

The clearly defined focus on research for tenure and promotion purposes does not currently provide motivation and incentive for faculty who are primarily interested in teaching.

Recommendation

Excellence in teaching is reflected by the successful implementation of new teaching methods, integration of technology in instruction, use of online resources, development of support materials and dedication to our students. Therefore, excellence in teaching should be one of the most valued aspects of faculty performance for tenure and promotion purposes.

FACILITIES

Office space is currently inadequate for the needs of the department. As part of the college's Master Plan, the fourth floor of the B building, where the Mathematics Department is housed, is slated to undergo renovations beginning in January 2013. According to the remodeling plans, the department will have fewer square-feet than we currently have and the number of square-feet per faculty in the offices has been reduced to about 90 square feet, far lower than the 120 square feet recommended by the Professional Staff Congress (*PSC*).

Recommendation

The Department strongly feels that this is an inappropriate treatment of the faculty and that the current remodeling plan should be revisited.

E. Vision for the Future

During the period covered by this study the Department has reached a level of commitment to innovation, excellence and stability that have to be noted. The future looks promising.

Attention to curriculum and assessment will be the established priorities for the Department. With College support, new programs will be developed and new interventions to support students will be implemented. These interventions will have a positive impact in the success of our students and the Department will show increased passing and retention rates in developmental courses as well as increased graduation rates for our STEM programs.

To succeed in these efforts the Department counts with a passionate, committed and well prepared team of faculty completely devoted to the success of our students.

Organization of this Academic review

This study is organized in six major components:

- Academic Program
- Outcome Assessment
- Curriculum Revisions and Innovations
- Students
- Faculty
- Facilities and Resources

I. ACADEMIC PROGRAM

The mathematics curriculum provides a variety of offerings that survey the meaning of mathematics as a logical system. The particular models chosen to exemplify these logical principles will vary from time to time depending on the current interests of our students and faculty. As such, models are meant to be illustrations only; the choice can be selective without any change of purpose.

The *Department of Mathematics* emphasizes for all of its students a conceptual understanding of mathematics together with problem solving and higher order analytic skills. The Department strives to develop students' ability to think precisely, creatively and critically, to speak clearly and persuasively, and to be aware of the intellectual power and significance of mathematical reasoning in today's technological society. The *Department of Mathematics* is committed to the highest standards of excellence in teaching and service.

Although the language of instruction is English, a few sections of some courses in the Mathematics Department are offered in Spanish, depending upon student needs.

A. Mission

The mission of the *Department of Mathematics* of Eugenio Maria de Hostos Community College is to provide for our multicultural student population, a majority of whom are female, minorities and from non-traditional backgrounds, a supportive learning environment, a strong foundation of basic knowledge in mathematics, and to prepare them for a variety of careers in which mathematics is a critical component.

For mathematics and engineering students, the Department strives to provide students with a broad and flexible educational program in a challenging, yet friendly, learning environment that is responsive to the needs of our diverse learning community.

B. Goals

- To provide students with the mathematical knowledge and skills that are necessary and useful in the study of other disciplines.
- To provide students in the liberal arts programs with a broader understanding of the foundation of mathematics, permeating different topics and transcending mere computation, with emphasis on logic and systematic constructions leading to more sophisticated mathematical models.
- To provide students with opportunities for an intensive learning experience and direct applications of knowledge in the field of mathematics and engineering.

C. Objectives

In order to reach its goals, the *Department of Mathematics* works toward reaching the following objectives:

- To enhance/reinforce the students mathematical thinking and communication skills to ensure that all students grow in their knowledge of mathematics
- To ensure that, in every course taught by the department, students are required to apply mathematical knowledge to solve real life problems so that mathematics concepts appear meaningful and relevant
- To ensure that every course taught by the Department stresses the importance of effective and rigorous mathematics communication and computation. Toward this end, all courses stress problem solving, intuitive understanding and collaborative learning strategies without forgetting skill acquisition and mathematical abstraction.
- To provide students with the appropriate technology necessary to enhance their understanding of mathematical concepts

D. Student Learning Outcomes (*SLOs*)

After completing the required program of study within the *Department of Mathematics*:

- Student will have developed expertise in the basic skills required to continue more studies in mathematics
- Students regularly will have engaged in mathematical problem solving
- Students will have developed mathematical thinking and communication skills
- Students will be able to identify, formulate and solve real life problems by applying mathematical knowledge
- Students will be able to communicate quantitative ideas effectively
- Students will be able to use and appreciate the use of appropriate technology for problem solving and as an aid in understanding mathematical concepts
- Students will able to read and construct rigorous proofs

E. Matrix Relating Each Course to the *SLOs*

	Student Learning Outcomes (SLOs)	*Courses Related to SLOs*	
1.	Students will regularly engage in mathematical problem solving	All courses	
2.	Students will develop mathematical thinking and communication skills	All courses	
3.	Students will be able to identify, formulate and solve real life problems by applying mathematical knowledge	All courses	
4.	Students will be able to communicate quantitative ideas effectively	All courses	
5.	Students will be able to use and appreciate the use of appropriate technology for problem solving and as an aid in understanding mathematical concepts	MAT 10 MAT 20 MAT 105 MAT 120 MAT 130 MAT 140 MAT 160 MAT 200 MAT 210 MAT 220 MAT 310 MAT 320 MAT 360	Basic Mathematics Skills Elementary Algebra Mathematics for Allied Health Sc. Intro. to Probability & Statistics Computer Literacy Intro. to Computer Science Pre-Calculus Modern Programming Language Calculus I Calculus II Calculus III Linear Alg. With Vector Analysis Differential Equations
6.	Students will be able to read and construct rigorous proofs	MAT 110 MAT 140 MAT 200 MAT 210 MAT 220 MAT 310 MAT 320 MAT 360	Number Theory Intro. to Computer Science Modern Programming Language Calculus I Calculus II Calculus III Linear Alg. with Vector Analysis Differential Equations

F. Brief course Descriptions

Please see ***Appendix F*** for a complete list of syllabi.

Course	*Description*
MAT 10	**BASIC MATHEMATICS SKILLS** This course provides the basic arithmetic skills that will be utilized in all subsequent mathematics and science courses. Topics: operations with whole numbers, fractions, decimals, ratio, proportion and percent, scientific notation, the metric system, word problems, and applications.
MAT 20	**ELEMENTARY ALGEBRA** This course provides basic skills in elementary algebra. Topics: operations with real numbers, operations with polynomials, powers with integral exponents, linear equations, simultaneous linear equations, and the Cartesian plane.

Course	*Description*
MAT 30	**INTERMEDIATE ALGEBRA** This course provides basic skills in intermediate algebra. Topics include system of linear equations in two or more variables, trigonometry of the right triangle, radicals, the system of complex numbers, graphs of conic sections, and graphs of trigonometric functions.
MAT 100	**INTRODUCTION COLLEGE MATHEMATICS** This course provides skills in finite mathematics. Topics include set theory, symbolic logic, systems of numeration, and the metric system.
MAT 105	**MATHEMATICS FOR ALLIED HEALTH SCIENCES** This course is designed for Allied Health majors and will aid them in applying mathematical concepts to on-the–job situations. The course includes an integrated review of the mathematical skills required in Allied Health Professions, in particular those topics pertaining to Pharmacology and Radiology.
MAT 110	**NUMBER THEORY** In this course students verify some fundamental properties of natural numbers, express numbers in different bases, find the greatest common divisors of two numbers by Euclid's algorithm, factor an integer by various methods such as Fermat's and Euler's methods, and become acquainted with several solved and unsolved problems in number theory. Students find the number of divisors of a natural number, the sum of the divisors, the product of the divisors, and the means of the divisors; become acquainted with perfect, multiple perfect, amicable and sociable numbers; analyze various theorems related to perfect numbers; study Euler's function; solve simple Diophantine equations; and study congruence.
MAT 120	**INTRODUCTION TO PROBABILITY & STATISTICS** In this course student explore, describe, and compare data by measures of central tendency and dispersion from selected sample data sets. Using the sample statistics, students are able to make a statement about the population parameters by confidence-level and hypothesis testing methods. Students also solve problems involving probabilities and their distributions. Other topics such as correlation, regression, chi-square and analysis of variance are also covered.
MAT 130	**COMPUTER LITERACY** This course provides a historical development of computers. Students have hands-on experience with a microcomputer. Students enter and run prepared programs.
MAT 140	**INTRODUCTION TO COMPUTER SCIENCE** In this course students study the following as they relate to computers: the algorithm, its expression as a flowchart, a computer model and a computer language (BASIC), computation of a data organization, arithmetic expressions, compound conditions, branching, arrays, and looping. Students also study the following as they relate to computers: approximations, functions and procedures, numerical applications, roots of equations, maxima and minima, areas, simultaneous equations, averages and deviation from the average.
MAT 160	**PRE-CALCULUS** This course provides essential concepts for the study of calculus. Topics include concepts in analytic geometry; algebraic functions; transcendental functions, such as exponential, logarithmic, and trigonometric functions; graph analysis; and applications.
MAT 200	**MODERN PROGRAMMING LANGUAGE** This course provides an introduction to problem solving methods and algorithm development through the study of the program, control structures, and data structures of the C++ programming language.
MAT 210	**CALCULUS I** This course provides skills in calculus in one real variable. Topics include limits, continuity, differentiation, applications to motion problems, maximum-minimum problems, curve sketching, and antiderivatives.

Course	*Description*
MAT 220	**CALCULUS I I** This course provides skills in differential and integral calculus. Topics include definite integral and its properties, numerical integration, applications of the definite integral to areas, solids of revolution and length, inverse functions, logarithm and exponential functions, conic sections, and translation and rotation of axes.
MAT 310	**CALCULUS I I I** This course provides skills in infinite series, geometry in the plane and space, and integral calculus in several variables. Topics: infinite series, solid analytical geometry, partial derivatives, and multiple integral with applications.
MAT 320	**LINEAR ALGEBRA WITH VECTOR ANALYSIS** In this course students study vector calculus, matrix algebra, system of homogeneous and non-homogeneous linear equations, concepts of vector space, subspace, basis and dimension of a vector space, linear transformation, and Eigenvalues and Eigenvectors for a linear transformation.
MAT 360	**DIFFERENTIAL EQUATIONS** In this course students formulate and solve differential equations of the first and second order. Students apply these methods to related practical problems. Students also formulate and solve linear differential equations with constant coefficients and apply these techniques to practical problems that give rise to such equations.

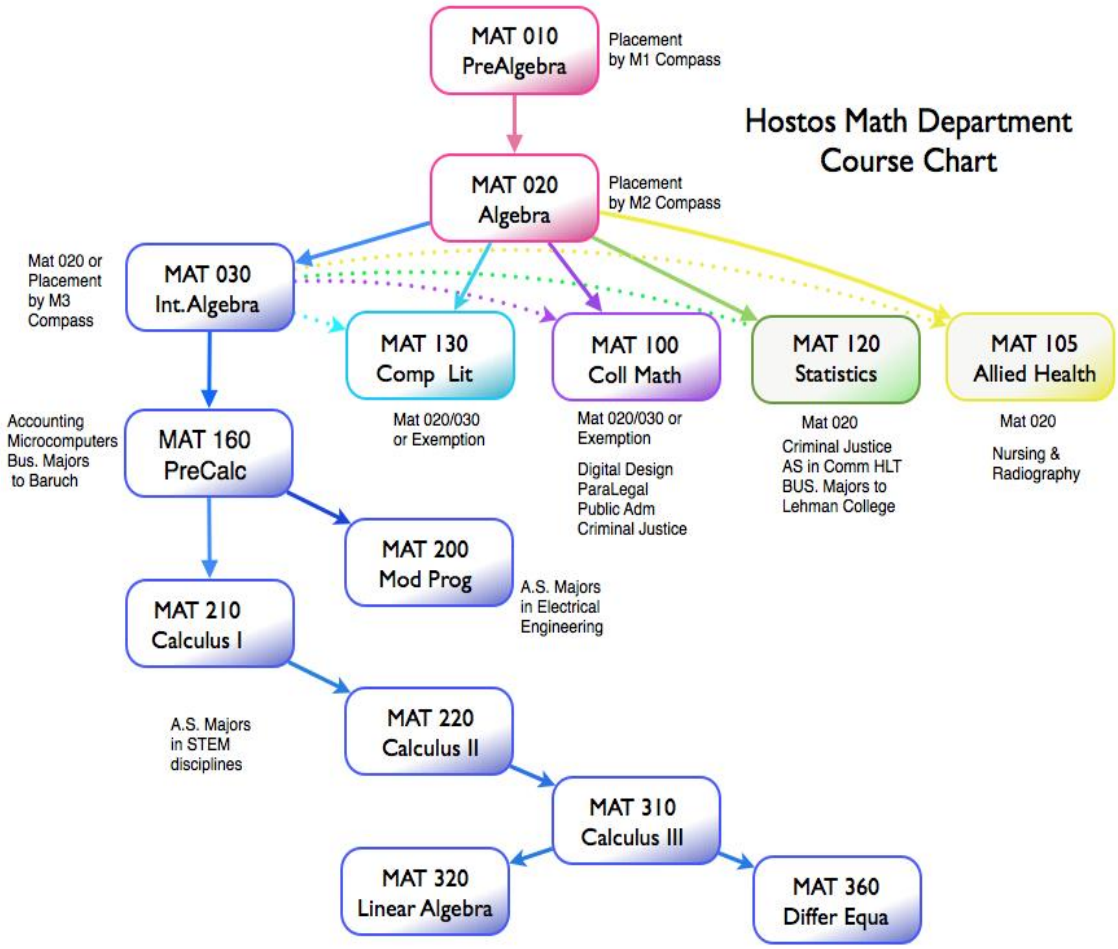
G. Courses and Associated Information

The information on retention and passing rate presented on the table that follows is an average from courses offered from spring 2008 to fall 2011. Notice that MAT 110: *Number Theory* and MAT 140: *Introduction to Computer Sciences* are not included in this list because these courses have not been offered for the past two years.

Course	*Credit Hours*	*Class Hours*	*Enrollment*	*Retention %*	*Passing Rate %*
MAT 10	0.0	6.0	929	85	57.8
MAT 20	1.0	6.0	921	81	60.8
MAT 30	2.0	6.0	177	81	72.5
MAT 100	3.0	3.0	308	86	83.8
MAT 105	3.0	3.0	288	85	88.3
MAT 120	3.0	4.5	192	85	89.0
MAT 130	3.0	3.0	115	87	84.2
MAT 160	4.0	4.5	214	82	76.6
MAT 200	3.0	3.0	17	88	71.4
MAT 210	4.0	6.0	68	89	85.0

Course	*Credit Hours*	*Class Hours*	*Enrollment*	*Retention %*	*Passing Rate %*
MAT 210H	4.0	6.0	12	75	77.8
MAT 220	4.0	4.0	46	80	69.2
MAT 310	4.0	4.0	22	92	95.5
MAT 320	3.0	3.0	29	93	85.7
MAT 360	3.0	3.0	27	85	88.5
New-ENGR				88	
MATH DISCIPLINE AVERAGE			3365	82.6	70

H. Courses Sequence Flow Chart



I. Articulation Agreements

There are currently two articulation agreements, both with the City College of New York. They are:

- Joint Program In Civil Engineering;
- Joint Program In Electrical Engineering.

Through these programs, the *Department of Mathematics* offers two Associate in Science (AS) degrees, one in Civil Engineering and another one in Electrical Engineering. These programs are jointly registered, dual admission programs with the existing Bachelor of Engineering in Civil Engineering (B.E./CE) and the existing Bachelor of Engineering in Electrical Engineering (B.E./E.E.) at the City College of New York. Both programs have been designed to meet the licensure guidelines of the Accreditation Board for Engineering and Technology (ABET). The programs provide Hostos students with the same curriculum as the first two years of the licensure qualifying civil engineering program required at CCNY.

Upon successful completion of the lower division at HCC, students have a seamless transition to the upper division of the baccalaureate program at CCNY. The collegial nature of the program facilitates the transition to the professional portion of the curriculum. Students in these programs enroll in the existing science and mathematics courses at Hostos and enroll in the two required engineering courses at CCNY while at Hostos. Students successfully completing the requirements of this program are eligible to receive an Associate in Science (A.S.) degree.

J. New Academic Programs

During the period of this academic review the *Department of Mathematics* has successfully developed three new programs:

- Joint Program In Civil Engineering;
- Joint Program In Electrical Engineering; and
- Associate In Science Degree In Mathematics.

The first two programs have been already described in the previous section.

The Associate in Science degree in Mathematics consists of courses which allow students to pursue further education and careers in Mathematics, Statistics and Mathematics Education. The program is a traditional sciences and mathematics program designed to articulate with any baccalaureate degree institution, CUNY or private. The proposed program includes the course work required in the first two years of a baccalaureate degree in mathematics.

The curriculum emphasizes the calculus sequence, linear algebra and differential equations courses, which are also required for the dual admission/joint engineering programs with City College.

K. Specification of the degree requirements

a) CIVIL ENGINEERING: PROGRAM REQUIREMENTS

SEMESTER		CREDITS
First Year – Fall		
MAT 210*	Calculus I	4.0
ENG 110	Expository Writing	3.0
CHE 210*	General Chemistry I	4.0
HUM 100	Introduction to humanities	3.0
SOC 101	Introduction to sociology	3.0
Total		17.0
Spring		
MAT 220*	Calculus II	4.0
ENG 111	Literature and Composition	3.0
CHE 220*	Chemistry II	4.0
PHY 210	Physics I	4.0
MAT 200*	Modern Programming	3.0
Total		18.0
Second Year – Fall		
MAT 310*	Calculus III	4.0
PHY 220	Physics II	4.0
PSY 101	General Psychology	3.0
CE 20900*	Structural and Site Plans	3.0
Total		14.0
Spring		
MAT 360*	Differential Equations	3.0
CE 26400*	Data Analysis	3.0
MAT 320*	Linear Algebra	3.0
ENG 202	Technical Writing	3.0
VPA 192	Public Speaking	3.0
Total		15.0
TOTAL HOSTOS CREDITS		**64.0**

b) ELECTRICAL ENGINEERING: PROGRAM REQUIREMENTS

SEMESTER		CREDITS
First Year – Fall		
MAT 210*	Calculus I	4.0
ENG 110	Expository Writing	3.0
CHE 210*	General Chemistry I	4.0
PSY 101	General Psychology	3.0
Total		14.0
Spring		
MAT 220*	Calculus II	4.0
ENG 111	Literature and Composition	3.0
SOC 101	Introduction to Sociology	3.0

MAT 200*	Modern Programming	3.0
CHE 220*	General Chemistry II	4.0
Total		17.0
Second Year – Fall		
MAT 310*	Calculus III	4.0
PHY 210	Physics I	4.0
ENGR 103*	Tool/Engineers	2.0
ENG 202*	Technical Writing	3.0
VPA 192	Fund. Public Speaking	3.0
Total		16.0
Spring		
MAT 360*	Differential Equations	3.0
ENGR 204*	Electric Circuits	3.0
MAT 320*	Linear Algebra with Vector Analysis	3.0
PHY 220	Physics II	4.0
Total		13.0
TOTAL HOSTOS CREDITS		**60.0**

c) A.S. IN MATHEMATICS: PROGRAM REQUIREMENTS

SEMESTER		CREDITS
First Year – Fall		
ENG 110	English Composition	3.0
MAT 220	Calculus I	4.0
Natural Science		4.0
Humanities		3.0
Total		14.0
Spring		
MAT 220	Calculus II	4.0
ENG 111	Literature and Composition	3.0
Natural Science		4.0
PSY 101 or SOC 101	General Psychology or Intro to Socio.	3.0
Total		14.0
Second Year – Fall		
MAT 310	Calculus III	4.0
HIS	History	3.0
Ethnic Studies	BLS or LAC or Foreign Language	3-6
Free Electives		3-6
Total		16.0
Spring		
MAT 360	Differential Equations	3.0
MAT 320	Linear Algebra with Vector Analysis	3.0
Free Electives		10.0
Total		16.0
TOTAL HOSTOS CREDITS		**60.0**

II. OUTCOME ASSESSMENT ACTIVITIES

Since the last Academic Review, the Department has gone through a period of renewal, exploration of new pedagogical ideas and development of new programs. At the same time and in compliance with Hostos Strategic Plan (2011-2016), the Department initiated the implementation of various outcome assessment initiatives. The outcome assessment initiatives undertaken by the Department can be classified as follows: Assessment of Supplemental Instruction used in the classroom and also Course Assessment.

A. Assessment of Supplemental Instruction Techniques Used in the Classroom

In this area the goal was to determine the effect of supplemental instruction in the passing and retention rates of remedial students. Two types of supplemental instruction were identified. They are: Supplemental Instruction with the Use of *MathXL* and Supplemental Instruction using *MathXL* and In-class tutoring.

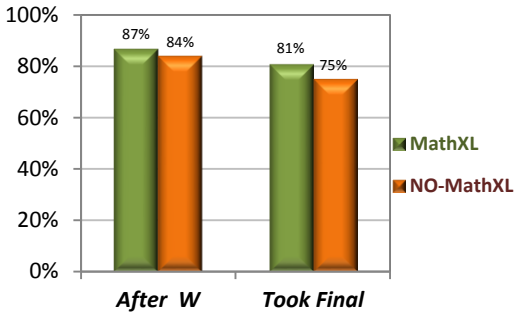
a) SUPPLEMENTAL INSTRUCTION WITH THE USE OF *MATHXL*.

At Hostos, the two exit-test based developmental mathematics courses, MAT 010 (Basic Mathematics Skills) and MAT 020 (Elementary Algebra), are taught four days a week, three by an instructor and the fourth (the MAT Lab class) by a tutor from Hostos' Academic Learning Center. Traditionally, the MAT Lab class is taught at the election of the instructor in one of two formats: Using departmentally-prepared pencil and paper exercises or assisting the students to complete that week's homework assignments in *MathXL*, an online homework, tutorial and assessment system developed by Pearson Education, Inc. The following studies show the positive impact that the use of *MathXL* has on student learning and how students using *MathXL* outperformed students who did not. While many faculty members would like to make use of this technology to improve the teaching and learning process, access to the codes has been limited. The Department has not been able to get a commitment from the Office of Academic Affairs to support the purchase of the *MathXL* codes in a regular basis.

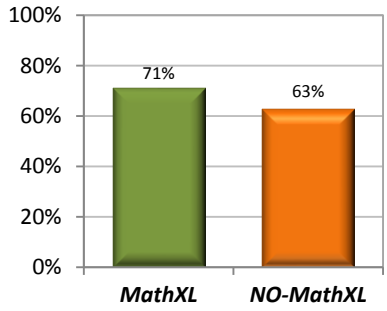
Porte (2011). In the fall of 2011, and through support from a Perkins grant, Professor Loreto Porte was able to secure 300 licenses of *MathXL* which were distributed to students of MAT 010. Data for all 900 students taking MAT 010 was collected after the midterm and final examinations. An analysis of performance, retention and attendance was performed. The results show that the group of students using *MathXL* performed better and showed a higher retention rate and attendance than those without access to *MathXL*.

The graphs that follow show the retention and performance rates for students using *MathXL* and students that did not.

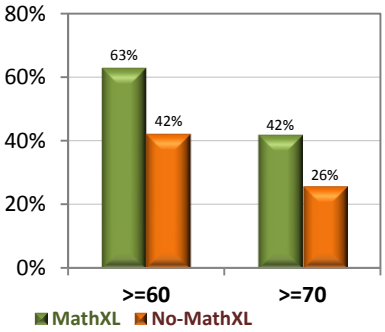
Retention after Withdrawal Period



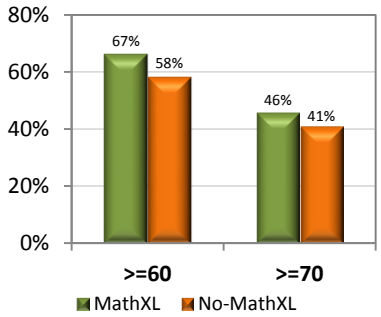
Retention of all Registered Students



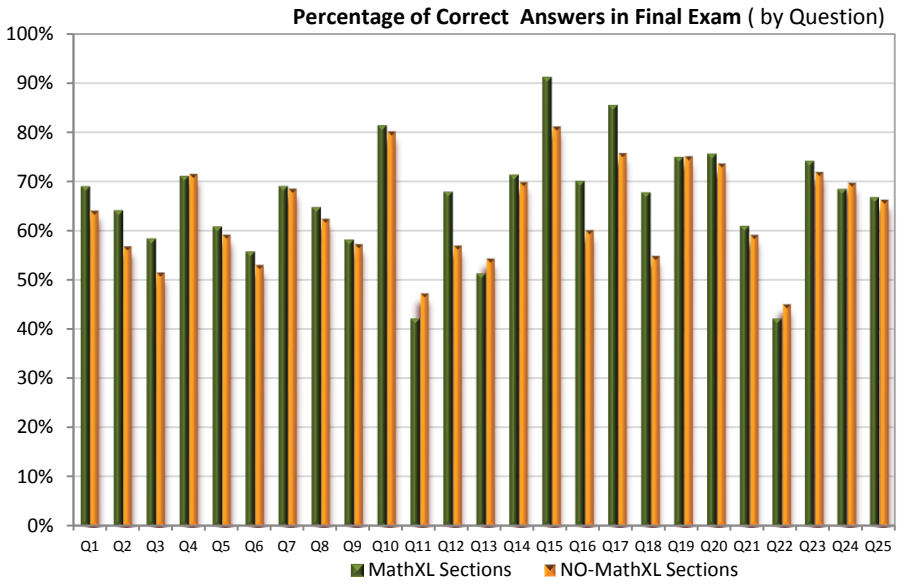
Performance: Midterm



Performance: Final Exam



The following table shows a comparison in the percentage of correct answers by question in the departmental final exam for students using *MathXL* and students who did not.



As part of this study, a 7-question satisfaction survey was distributed to students registered in ten sections that had used *MathXL*. Students responses show high appreciation for having

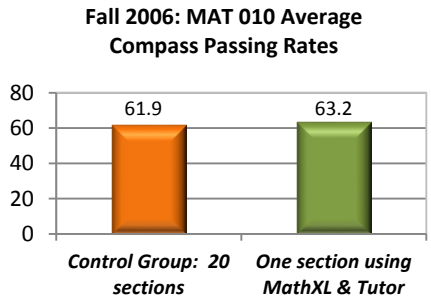
access to *MathXL* . Interesting to notice is that while 90% of the respondents said that they would like to continue using *MathXL* in subsequent courses, 53% said that they preferred using pen-and-paper when taking exams. Responses from the students to the complete survey can be found in ***Appendix G***.

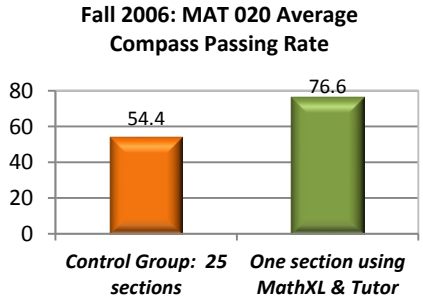
b) SUPPLEMENTAL INSTRUCTION WITH THE USE OF *MATHXL* AND IN-CLASS TUTORS

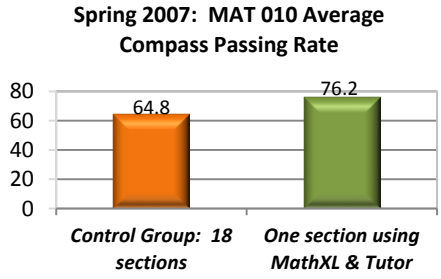
- **Menil, Dias** (2007). Initial research at Hostos on the efficacy in developmental mathematics classes of having in-class tutors and online interactive homework using *MathXL* was first conducted by Professors Violeta Menil and Olen Dias in 2007 pursuant to a CUNY grant "The Effectiveness of the 'Do Math' Approaches—The Bridge to Close the Cognitive Gap Between Arithmetic and Algebra." In addition to other findings, this research demonstrated the success of this online homework tooling enhancing both student engagement and student homework performance. The table and graphs given below show these results.

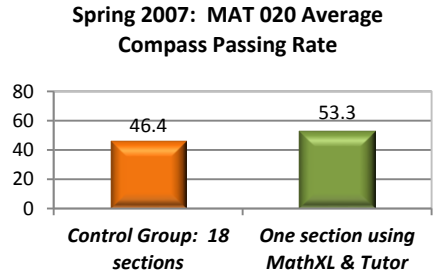
Summary of Compass Passing Rates

FALL 2006	Courses	Department Passing Rate	One Section Using *MathXL* & Tutors
	Basic Arithmetic: 20 sections	61.9	63.2
	Elementary Algebra: 25 sections	54.4	76.6
SPRING 2007	**Courses**	**Department Passing Rate**	**One section using *MathXL* & Tutors**
	Basic Arithmetic: 18 sections	64.8	76.2
	Elementary Algebra: 25 sections	46.4	53.3





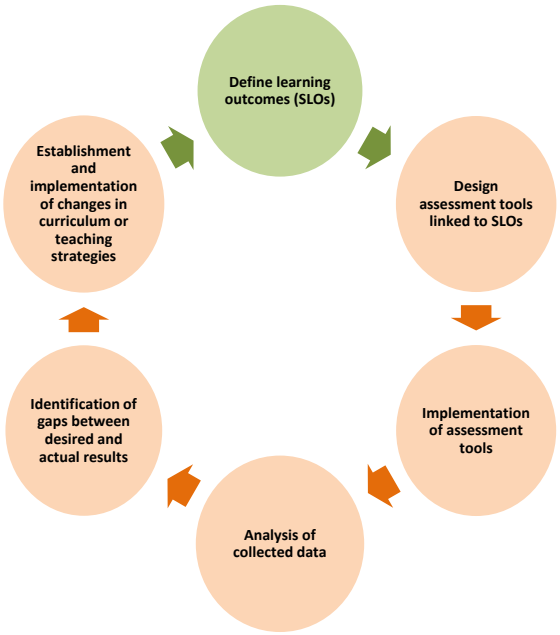




- **<u>Cunningham, Dias</u>** (2010). Further research on the efficacy of *MathXL* in enhancing student performance was conducted during the fall 2010 semester by Professors Alice Cunningham and Olen Dias pursuant to a grant, *The Effect of Small Group Homework Tutoring on Remedial Mathematics Learning,* awarded by the CUNY Central Office of Academic Affairs under its summer 2009 *Improving Undergraduate Mathematics Learning* initiative.
  Professors Cunningham and Dias conducted an 18-section, 529 student experiment testing three MAT Lab conditions: (a) an experimental group using *MathXL* with multiple tutors; (b) a control group (C1) using *MathXL* with the traditional single tutor; and (c) a control group (C2) using the pencil and paper exercises with a single tutor.
  While a report with tables and graphs summarizing these results is attached as ***Appendix E***, the results show that, in terms of performance and attendance, those students using *MathXL* outperformed the students working with pen and paper.

B. Course Assessment.

The Mathematics Department understands assessment as a cycle that begins with the establishment of desired student learning outcomes (*SLOs*.) Therefore, in order to determine if our students are learning, the Department undertook the task of establishing Learning Outcomes (*SLOs*) for all the mathematics courses. Currently about 90% of the courses offered by the Department have *SLOs* which are clearly stated in the syllabus for the respective courses. (Syllabi with *SLOs* may be found in ***Appendix F***.) The graph that follows shows the course assessment cycle.



The courses that were considered to initiate the course assessment process were: **MAT 010**: *Basic Skills* and **MAT 020**: *Elementary Algebra*. At this moment, and following the previously mentioned cycle, the Department is in the process of designing strategies to improve student performance in the areas identified as weak.

a) COURSE ASSESSMENT: MAT 010

The MAT 010 study collected data for all sections of MAT 010. A total of 922 students registered for the classes. After the withdrawal period, 808 remained registered in the class, showing an 87% retention rate. Of these students, 635 took the final exam.

The Department has determined that to consider a *SLO* to have been met, at least 60% of the students should have the corresponding question correct. For this reason we have the following rubric for SLO evaluations:

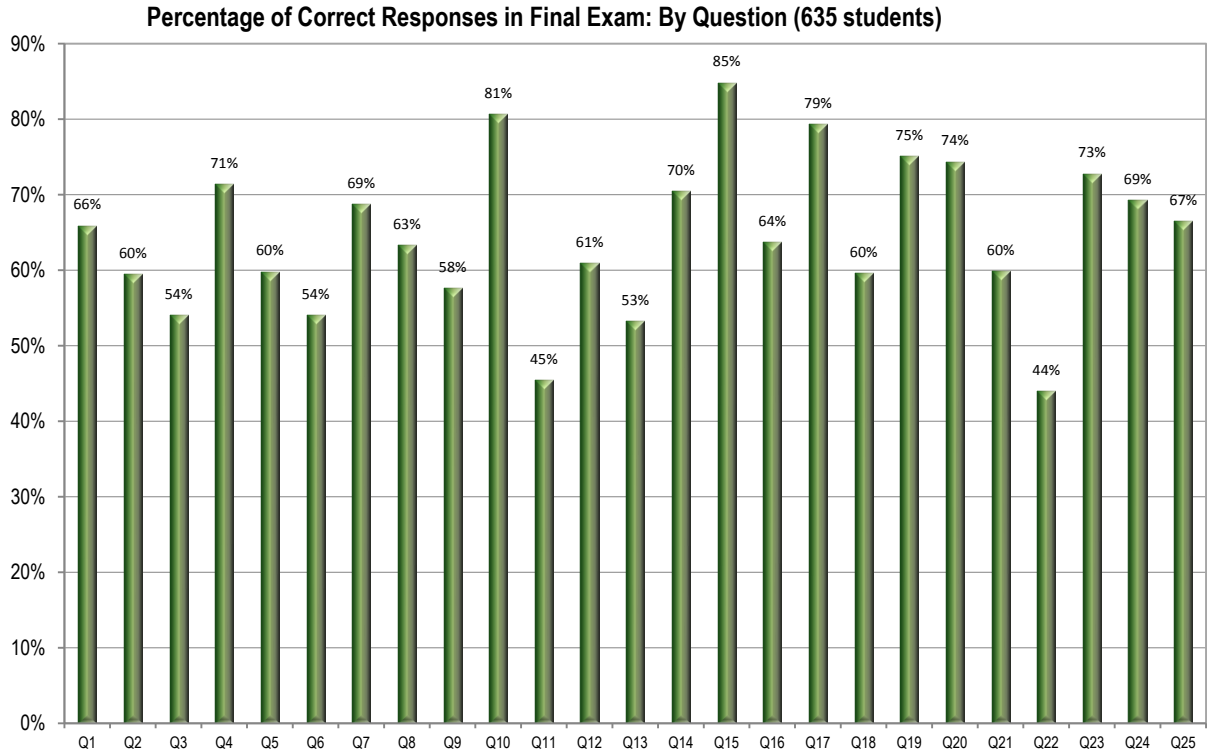
70% or above:	S+	Above satisfactory
60%-69%:	S	Satisfactory
50-60%:	N	Needs improvement
Below 50%:	U	Unsatisfactory

What follows is a grid showing the *SLOs* established for MAT 010 and the association of the questions in the departmental final exam to the *SLOs*.

Student Learning Outcomes (*SLOs*)	**(Q#)**	**% CORRECT Answers**	***SLO* Status**
1. Set up a Real Number Line and plot on this line: whole numbers, fractions, decimals as well as integers	Q10	81%	S+
2. Read and write real numbers including: Whole numbers, fractions and decimals	Q5	60%	S
3. Compare and order real numbers using the less than or more than symbols	Q8	63%	S
4. Round off whole numbers and decimals	Q4	71%	S+
5. Convert between representations of real numbers including: decimals, fractions, and percent as well as between scientific notation and either decimal or whole number.	Q2 Q3 Q19	60% 54% 75	S N S+
6. Perform operations in correct order (order of operations): addition, subtraction, multiplication and division on real numbers	Q6 Q7 Q9 Q11 Q20	66% 54% 69% 45% 74%	S N S **U** S+
7. Set up and solve application problems involving selecting and applying operations on real numbers. Set up and solve application problems involving ratio, rates and proportions as well as percent application problems	Q12 Q13 Q14 Q21 Q23 Q24	61% 53% 70% 60% 73% 69%	S N S+ S S+ S
8. Solve basic: ratio, rate, proportion, percent and average problems	Q1 Q5	66% 85%	S S+

	Q16 Q17 Q18	64% 79% 60%	S S+ S
9. Conversions within and between systems of measurements including the English (US) and metric system	Q22 Q25	44% 67%	**U** S

The graph below shows the percentage of correct responses, by question, for all students that took the departmental exam.



Student performance on the *SLOs* was overall in the satisfactory range. Furthermore, student performance on individual questions rated *Satisfactory* (S) or *Above Satisfactory* (S+) for 20 of the 25 questions on the test. Of the three questions rated as *Needs Improvement, two* involved fractions which is a typical weak area for the students. Only two questions, 11 and 12, were considered *Unsatisfactory* (U). Question 11 involved quotients of mixed numbers and question 22 was a two-step word problem involving an operation on numbers and then a conversion with the metric system. Students experienced considerable difficulty with these topics and thus the Department will explore strategies to improve the student performance in these areas.

b) COURSE ASSESSMENT: MAT 020

The MAT 020 *Elementary Algebra* assessment was done with the assistance of the Hostos Office of Instructional Research (OIR) using the MAT 020 final exam in fall 2010. The MAT 020 assessment studied 535 randomly selected students grades from the final exam, which was not multiple-choice. In advance, the MAT 020 committee had decided

which test question(s) corresponded to which student learning outcomes (*SLOs*) and had modified some of the questions to better reflect the learning outcomes. The instructors marked students' work as follows:

Wrong: 0
Correct: 1
Partial correct: ½

The sum of all scores for each *SLO* was divided by the number of questions from the final in the given *SLO* to find the average score reported in the table given below.

The Department has determined that to consider a *SLO* met, at least 60% of the students should have the corresponding question correct and less than 30% receiving NO credit. For this reason we have the following rubric for assigning a letter grade for *SLO* evaluation:

60% or above with credit and less than 25% No Credit	S+	Above satisfactory
50%-59% with credit and less than 30% No Credit	S	Satisfactory
40-49% with credit and less 40% No Credit	N	Needs Improvement
Below 40%:	U	Unsatisfactory

What follows is a grid showing the *SLOs* established for MAT 010 and the association of the questions in the departmental final exam to the *SLOs*. (All percentages were rounded to the nearest whole number)

	Student Learning Outcomes (*SLOs*)	**Question**	**% Correct**	**% No Credit**	***SLO* Status**
LO 1:	Performing operations on real numbers,	1, 2, 3	51%	25%	S
LO 2:	Evaluating algebraic expressions.	4, 7, 8	51%	24%	S
LO 5:	Simplifying exponential numerical expressions, including: power rule, product and quotient and scientific notation	9, 11, 35	42-46%	27-30%	S
LO 6:	Performing operations on polynomials, simplifying algebraic expressions by combining like terms.	7, 12, 13, 14	51%	23%	S
LO 3:	Solve linear equations and inequalities in one variable	16-20	45%	22%	S
LO 4:	Translate word problems into algebraic equations and solve them	5 ,6, 31,36, 37	39%	37%	U
LO 7:	Factoring polynomials	25 ,26, 27, 28,			U
LO 8:	Solving quadratics	32, 33	36%	34%	U
LO 9:	Simplify Rational Expressions		41%	34%	N
LO 10:	Write and graph linear equations in the Cartesian coordinate plane using various techniques and	21, 22, 23, 24	37%	30%	U

	properties of linear equations.				
LO 12:	Perform operations on and simplify radicals and roots	38, 40	39%	35%	U
LO 11:	Solve systems of equations in two variables	34	39%	39%	U

These assessment results show that factoring (*SLO* 7) algebraic expressions or polynomials remains an area of weakness in the mathematics curriculum. As factoring is used in solving quadratic equations (*SLO* 8) and rational expressions (*SLO* 9) it is a critical area in the algebra curriculum. The faculty has met to discuss how to teach factoring, especially factoring trinomials ax^2+bx+c with leading coefficient $a \neq 1$, but this topic remains difficult. Another possibility discussed is to integrate factoring earlier into the curriculum alongside the multiplication of polynomials, as factoring can be viewed as the inverse process to multiplication.

Other areas of concern listed in order of priority or student difficulty are: Graphing, radicals, and solving systems of equations in two variables. However, there is a new CUNY wide exit / final exam that will be in place shortly, and further evaluation of *SLO* will need to be conducted after this new exam is in place.

C. Analysis of Course Grade Patterns

Hostos Community College awards letter grades to denote the level of achievement for each course. Effective fall 2006, the grading system is as follows:

Letter Grade	Range	Point Vale
A	93.0 – 100	4.0
A-	90.0 – 92.0	3.7
B+	87.0 – 89.0	3.3
B	83.0 – 86.0	3.0
B-	80.0 – 82.0	2.7
C+	77.0 – 79.0	2.3
C	70.0 – 76.0	2.0
D	60.0 – 69.0	1.0
F	00.0 – 59.0	0.0
R*		

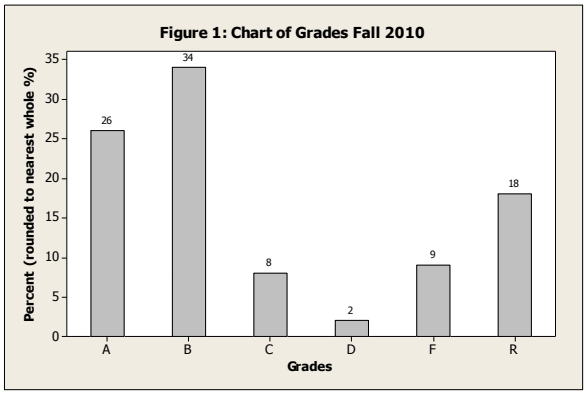
*Given in courses designated as developmental (remedial courses with credit and excess hours) and remedial courses. An "R" grade is given when a student has not reached a minimal level of proficiency for the course, but has fulfilled all three of the following conditions: (a) satisfactory attendance record; (b) satisfactory completion of in-class and homework assignments; (c) satisfactory progress toward the performance objectives of the course. The "R" grade is not included in the computation of the GPA. In Mathematics this grade can be given only once in MAT 010 and MAT 020 only.

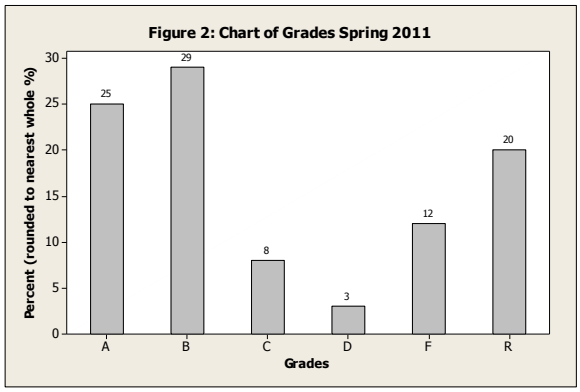
a) CUMULATIVE GRADE DISTRIBUTIONS FOR THE MATHEMATICS DEPARTMENT

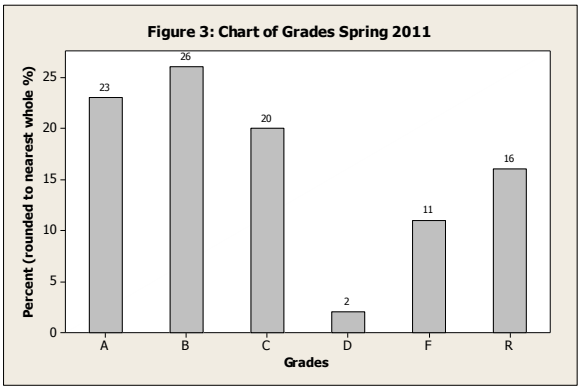
The grade distributions for the entire math department were only available for the three semesters listed below. Prior to Fall 2010, grades were summarized by course only.
The Office of Institutional Research groups the grades according to the following scheme:
A is 90-100, B is 80-89, C is 70-79, D is 60-69, F is 0-59, R is a grade assigned in MAT 010 and MAT 020 only.
Notice that grades of W, WU, WN, WA and INC are NOT included in the analysis

Three charts are given below which show the distribution of grades for all courses offered by the Department in fall 2010, spring 2011, and fall 2011.

As seen from these three bar charts, roughly a quarter of all students taking a math course during the last three semesters received a grade of A (more precisely, A or A-). The B grade was consistently the most frequent grade earned by our students. There was a very significant increase in the percentage of C grades received in the fall 2011 semester. This increase reflects an important change in the Department's grading policy for MAT 010 and MAT 020. Due to several different factors, one of which was the abolishment of the COMPASS exam as the criterion for exit from remediation, the Department added the grades of C and C+ as allowable grades for MAT 010 and MAT 020. This change could also explain the slight decrease in B and R grades from spring 2011 to fall 2011.





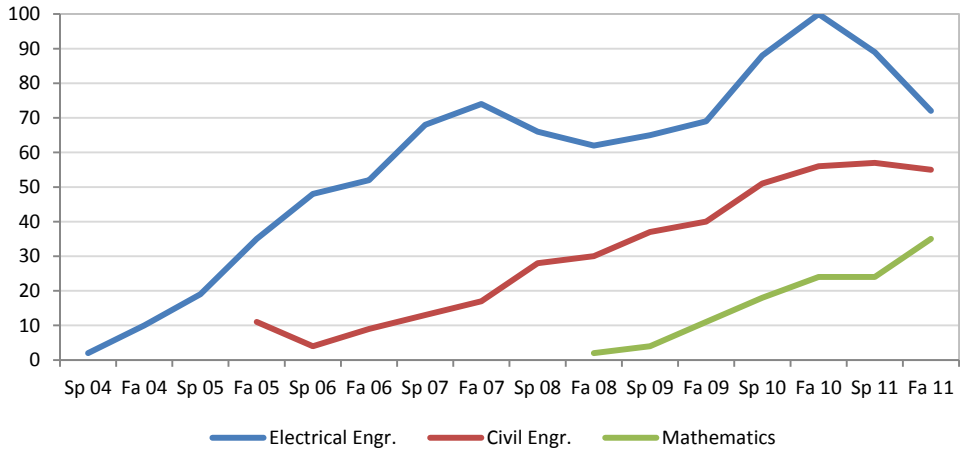


D. Academic Programs Assessment

As already mentioned in *Chapter I: Academic Program*, the Department has two joint STEM degree programs with City College CUNY, and an AS in Mathematics. These majors serve as conduits to attract minority students into STEM careers. The joint program in Electrical Engineering (A.S./B.E.) was established in fall 2003. The joint program in Civil Engineering began enrolling students in fall 2005. The A.S. in Mathematics began in fall 2008. The development of these programs fulfills most of recommendation 3 of the 1998 *APR* for the Department which called for the creation of a Pre-Engineering program.

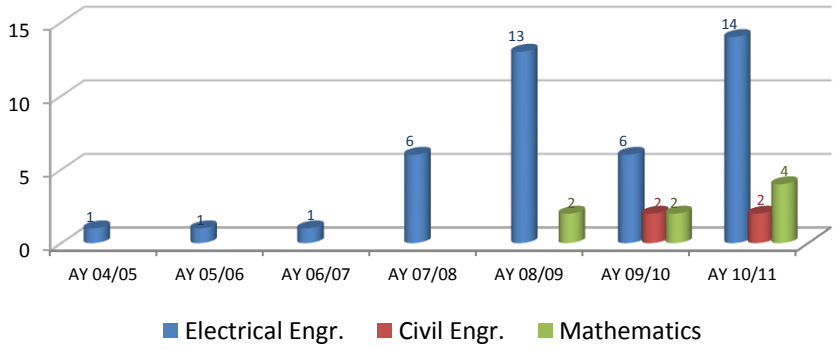
a) ENROLLMENT

The engineering majors experienced a constant increase in enrollment from conception to about 2010 when they began to level off, while the A.S. major continues to increase in enrollment as shown in the following figure.



b) GRADUATION

It is important to note that students identify themselves as engineering students or A.S. majors when they first enter the College, even though they do not meet the requirements for the program. This is one reason it takes these majors about 3.5-4.0 years to graduate. It is also important to realize that Civil Engineering more than Electrical Engineering required a substantial number of courses to be taken through e-permit at City College and this process has proven to be difficult for our students. The following figure shows graduation rates for these programs.



The low graduation rate in the Civil Engineering major is an area of concern that has been addressed by a program revision conducted in fall 2011. In order to assist retention of engineering students and their transfer between colleges, City College and Hostos revised the engineering program of study in fall 2011 so that students would take more science and elective courses at Hostos and wait until they transfer to City College to complete their engineering courses. It is expected this program revision will improve student retention and graduation rate in the Civil Engineering major.

c) REPRESENTATION

Minorities and females in STEM careers and majors are under-represented. The AS majors offered by the Department have been highly successful in attracting minority students. However, the students' academic preparation and the low enrollment of females continue to be areas of concern. The Department should make concerted efforts to attract more females to STEM programs.

In the academic year 2008-2009 the OAA did a review of the Engineering Dual Programs and the department. At that time the number of minorities and female students were as follows: For Electrical Engineering the results show that 62% are Hispanic, 28% are black and 6% are female.

Admissions and Enrollment Trends in Engineering Programs at HCC-Spring 2009

HCC program	Total students	Number of female	Number of Hispanic	Number of Black
Electrical Engineering	65	4	40	18
Civil Engineering	37	4	No Data	No data

At that time (2008-2009) City College and Hostos decided that, since the enrollment of engineering students at Hostos had increased significantly, our institution could offer two engineering courses avoiding in this way the need for e-permits to take them at City College. One of these courses, ENGR 204: Electrical Circuits, is now offered at Hostos Community College by the Mathematics Department and the students are doing well.

The development of the A.S. majors in Engineering and Mathematics have had a noticeable positive effect upon the ability of the mathematics department to offer multiple sections of advanced courses.

E. Student Evaluations for Course Improvement

Student evaluations are conducted each semester. Every class taught by an instructor is evaluated. A college-wide evaluation instrument, the *Student Feedback Form*, developed and ratified by the appropriated governance structures, is used.

The data collected for 48 sections taught by full-time faculty in the fall 2011 show that an average of 6.6 students per course completed the evaluation. This number is not encouraging if this instrument is intended to guide the faculty to improve their courses. The faculty in the Mathematics Department feels that this very low number of responses is due to the procedure being currently used for the administration of the evaluation forms.

a) THE PAST PROCEDURE:

- Each faculty member was responsible for having these evaluations administered.
- The evaluations were conducted in class with pen and paper and at least two weeks before the end of the semester.
- The numbers of responses when this procedure was used was high and meaningful, as only students that were actually attending the class could complete the form.
- Faculty could use the student feedback as a guide to improve their teaching.

b) THE CURRENT ONLINE PROCEDURE:

The online student evaluation was introduced about three years ago, and a significant decrease in the number of responses became evident immediately. For one year instructors could opt to have the evaluations conducted in class; however two years ago the online procedure became the only one available.

Members of the Department fell strongly that the online evaluations tend to be biased and unreliable. The Department has identified the following areas of concern:

- In the spring 2011 the online evaluations were available to students until the last day of the semester, which meant that the students were able to complete the evaluation knowing their course grade.
- In the fall 2011 semester, the evaluations were open until just before final exam period. That meant that students who were not attending the class and who, in some cases, had more than 40% absences, were still able complete the evaluation online. Obviously this is not a fair scenario for the instructor being evaluated.
- The number of the students that complete the online evaluations is extremely low to really have a meaningful impact on course improvement.
- Another notable difference in the evaluation results between before and after paper evaluations is that the number of written comments, which are inherently more useful to the instructor than mere quantitative measures, has

significantly decreased when the paper evaluations were replaced by online evaluations. Students seem to write more detailed evaluation comments when they're doing so in class and on paper.

The faculty members of the Department feel strongly that student evaluations are important and should have an impact in the way we teach. However for this to happen, the issues presented here should be addressed or, even better, the college should offer the faculty the option to conduct the evaluations in class.

III. CURRICULUM REVISIONS AND INNOVATIONS

The Mathematics Department has concentrated its efforts in the areas of curriculum and assessment. This section includes an analysis of the Department's effort in the areas of curriculum revisions, curriculum innovations, and integration of technology in instruction.

A. Curriculum Revisions

During the period covered by this review, the Department has initiated a complete examination of its courses offerings. In doing so, the Department has:

- Revisited all syllabi. A complete list of syllabi may be found in ***Appendix F***.
- Established student learning outcomes (*SLO*) for all courses.
- Developed strategies and assessment instruments that have been used to demonstrate the extent to which learning was achieved for two of our developmental courses. In this area, the Department has developed and implemented:
  - Uniform departmental midterms for Mat 010 and Mat 020 given before the withdrawal deadline in an effort to provide students with a clear understanding of how they are doing in the course and what areas they need work on before the final.
  - Uniform departmental final exams for MAT 010 and MAT 020.
- Analyzed the student performance on the previously mentioned uniform exams and determined the weak areas in student learning.
- Started discussion to recommend and implement strategies to improve the learning in the identified weak learning areas.
- Started the process to develop similar assessment tools and strategies for all other courses.
- Redesigned, renamed and currently offer a computer science course that had not been offered in over 10 years. This course, *MAT 200 Modern Programming* is available to engineering and AS in mathematics majors.

Also during this period, all mathematics courses have been renumbered from four-digit to three-digit codes in order to match the numbering system at other CUNY colleges and simplify the student transfer from Hostos to senior colleges.

B. Curriculum Innovations

<u>New Programs</u>

- The Department developed two Dual/Joint Programs in the STEM with City College . The first was in Electrical Engineering and the second in Civil Engineering. Since these majors have been initiated we have graduated over 35 students in the last 5 years (and more graduating this year.) These programs have been described in detail under ***Articulation Agreements***Articulation Agreements on *page* ***12*****.**

- The Department has developed an AS in Mathematics Major and completed an articulation agreement with Lehman College for students in this major. The number of students in this major has steadily increased from 3 to 24. This program have been described in detail under ***A.S. in Mathematics: Program Requirements*** on ***page 14***

New courses.

- At the request of—and with the assistance of—the Allied Health Department the Mathematics Department created a new course, MAT 105, specifically designed for Nursing (Pharmacology) and Radiography majors.
- To adapt to new regulations required by CUNY, the Department is in the process of developing a new course: *Quantitative Reasoning*.
- A *Honor Calculus* course was developed and was offered for the first time in fall 2011.

C. Improving the Learning of Mathematics through Technology

The Department of mathematics recognizes that everywhere in the academic world new technologies are increasingly being brought to the classroom to enhance classroom learning and to strengthen student professional development. With this in mind, the Department has implemented several initiatives to integrate technology in the Department curriculum

a) MOBILE TECHNOLOGIES

During the academic year 2007, with the support of the Perkins grant, PDAs and Pocket PCs for student use were purchased for the Mathematics Department. A team of faculty and technical support staff developed interactive materials for these PDAs and Pocket PCs so that they could be used in our developmental courses. This project uses the Palm software "*Quizzler*" to drill and assess students in a Basic Mathematical Skills class. Quizzes are created in the PDA itself or in a word processing program and uploaded to the PDA. The instructor then "beams" a quiz to the students. On completion, the students receive their scores immediately and then beam the results back to the teacher. Using a PDA grade book tool the instructor can examine the scores. All the individual scores and the class average score can be seen instantly as well as statistics on class performance on each question, allowing individual and class assessment of comprehension of the different topics covered.

Several reports submitted to the NYS DoE stated the positive impact that this technology had on the passing rates of our students. Two faculty members of the Department use this technology in 4-5 sections each semester.

b) INTERACTIVE TUTORIAL WEB SITES

Website for Preparation for COMPASS

When CUNY determined that the COMPASS exam had to be used as an exit from remediation exam, the Department undertook the task of developing an interactive tutorial web site. The COMPASS website for MAT 010 and MAT 020 students was developed by a team of faculty and technical support staff and included:

- 15-question Interactive Diagnostic Exam for each of the courses.
- 15 mini-tutorials (5 questions each) for each of the courses. These tutorials are interactive, provide appropriate feedback for any possible wrong answer and present detailed solutions to the given problems.

The COMPASS website was extremely successful; it was used by many sister institutions within CUNY and also by some institutions outside New York.

Website for Preparation for new CUNY Exit from Remediation Exam

In the academic year 2011, CUNY determined that the COMPASS was no longer to be used as an exit from remediation exam and new CUNY-wide final exams had to be developed and implemented. Once again the Department had to adjust to the new protocols. In doing so, a team of faculty and technical support started the development of new websites adjusted to the newly CUNY established learning outcomes and criteria for exit from remediation. The development of this tutorial site is in progress and the first component will be available to students during the fall of 2012, not only through the internet but also through smart mobile phones.

c) Interactive Software for Classroom Use

MathXL: A whole section of this academic review is dedicated to the use of this interactive software starting on ***page 15*** under ***Supplemental Instruction with the use of MathXL***. It is important to point out that due to the improved performance of students using *MathXL*, several professors would like to use it in their classes if the software were available to students.

SPSS: This statistical package is used in all sections of *MAT 120: Statistics and Probabilities.*

Graphic Calculators: Several instructors use graphic calculators, which are provided to students as a loan for the semester, in Pre-Calculus and Calculus classes.

Mathematica: This software is available through CUNY licenses. It is being used in the Honors Calculus class.

d) ePortfolios

ePortfolios is another college-wide initiative being supported by the Mathematics Department. They are introduced as a tool to use for the students' overall self-evaluation of their experience in one section of the *Statistic and Probabilities* course. Students are asked to create the *Welcome*, and *About Me* pages; as well as to post their *Final Data Analysis Projects* in their ePortfolios. The instructor believes that "even the initial steps are enriching the students' overall learning experience," and in the future he intends to use those past students' E-Portfolios, which contain their projects, as sample work.

e) Online Instruction

As part of the college effort to integrate technology in instruction and to develop asynchronous and hybrid courses, some members of the Mathematics Department started developing online materials for classroom use. The end product of this initiative

is that the Department currently offers two hybrid courses and one asynchronous course. The online component of these courses is designed to:

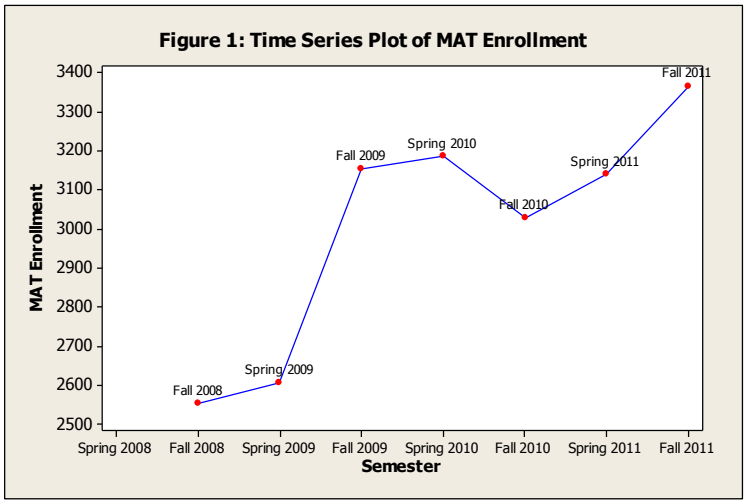
- Provide students with much greater access to the instructor, and to classmates. This increased access enables students to develop a deeper understanding of the topics they have worked with in the past. Students spend time on a regular basis learning the course content, solving routine and challenging exercises, and participating in online discussions with their peers and the instructor,
- Increase student participation in the learning process, and
- Assist students to become more familiar with the course content and to allow them to ask questions, share their ideas, and self-test their grasp of concepts outside the classroom in a less intimidating environment.

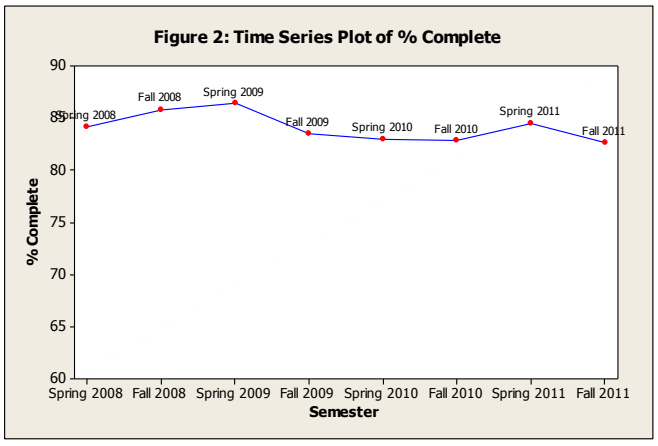
IV. STUDENTS IN THE DEPARTMENT'S ACADEMIC PROGRAM

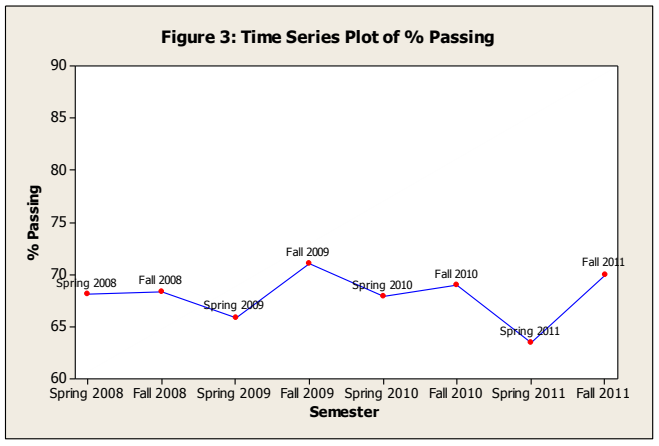
A. Enrollment

a) Departmental Enrollment, Retention And Passing Rates

The overall enrollment in mathematics courses has increased significantly in the last four years from about 2550 to 3350, **an approximate increase of over 30%** as can be seen in Figure 1. As shown below**, the increase in our student population did not have any negative effects on the general retention and passing rates**, each averaging at 84% and 68%, respectively (see Figure 4 and Figure 5). The time plots below (Figures 2 and 3) do not show any significant dips or rises. It is important to point out that in the fall of 2011, the average passing rate increased by 5 percentage points after suffering a temporary, and almost equivalent, dip in the spring of 2011.

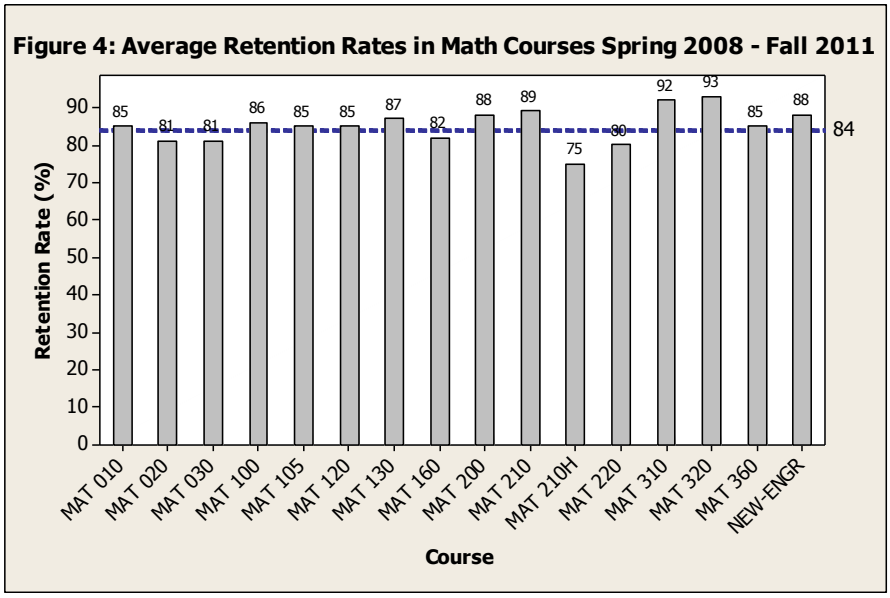






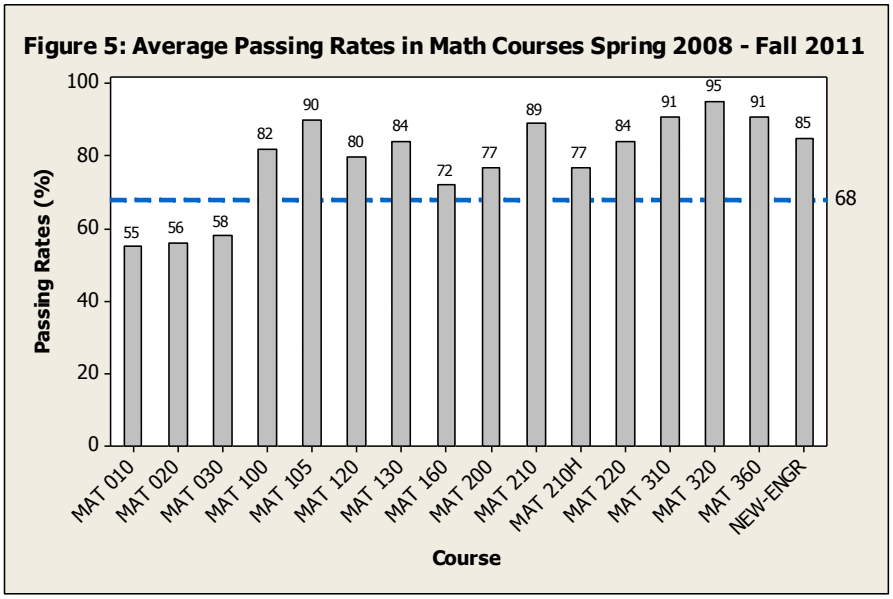
One of the main reasons why the overall passing rate is not very high is the fact that more than half of the sections offered by our Department are remedial mathematics courses. In such courses, the average passing rates are in the high 50s as can be seen in Figures 5, and 9. The passing rates for college level courses are significantly high, as can be seen in Figures 5, 10, and 11. For some of the college level courses the passing rates have, at certain points, been at **100%**.

As seen in *Figure 4* below, the average retention rates are almost uniformly distributed across the different courses. The lowest rate is **75%** for MAT 210H, which is a calculus I honors course offered for the first time in the fall of 2011. This course is more challenging and is the first honors course for our Department and for our math students, some of whom may not have been quite prepared for the challenge. This course is being offered again in the spring 2011 semester, and we are expecting to see better results. It is interesting to note that **the two courses with the highest retention rates are MAT 310 and MAT 320**, Calculus III and Linear Algebra, respectively. This result suggests that students who have reached this level of mathematics are very unlikely to drop courses for which they are registered.



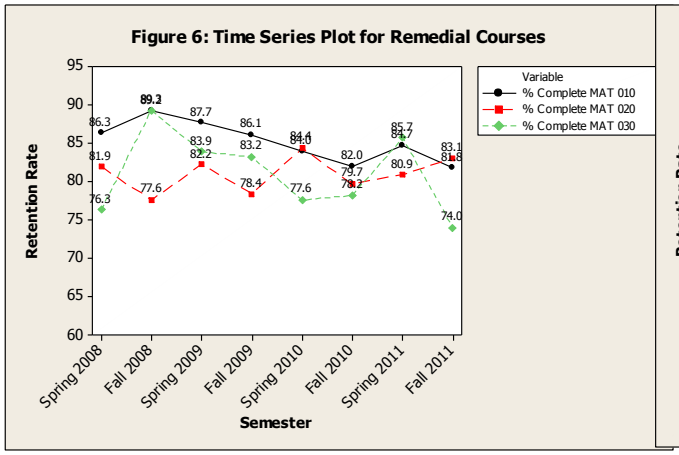
A significant difference in passing rates between the remedial courses and the college level courses can be noticed in Figure 5. This implies two possible, not mutually exclusive, conclusions: (**1**) **even though students find remedial courses difficult, once students make it out of remediation, their success rate is significantly improved**, and (**2**) **students who enter Hostos at the college level, on average, have moderate to high success rates**. This data does illuminate the fact that more work needs to be done in addressing our remedial students' success rates. We, as a department, are continuously

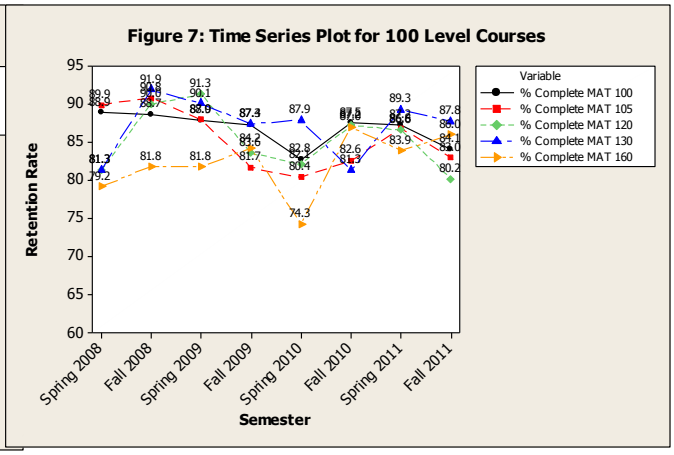
working on this issue through departmental discussions, different intervention techniques and outside consultations.

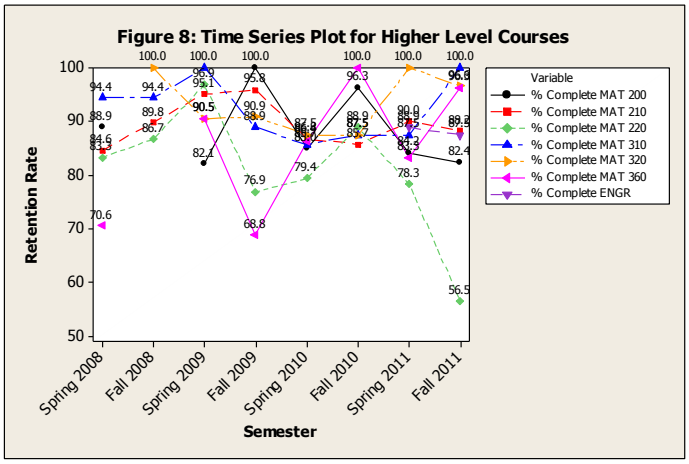


b) Retention Rates By Group (Remedial Courses, 100 Level Courses, Higher Level Courses)

One of the main points illustrated in the three figures below is that retention rates are consistently higher for introductory college-level mathematics courses (Figure 7) and upper level courses (Figure 8). **For higher level courses, the retention rates have reached 100% on a significant number of occasions** as seen in Figure 8. The only visible anomaly is the significant drop in retention for MAT 220 (Calculus II) in the fall of 2011. More analysis is needed to understand the drop, which could be explained by factors outside the control of the department. We, as a department, will observe the future retention rates for this course very closely.





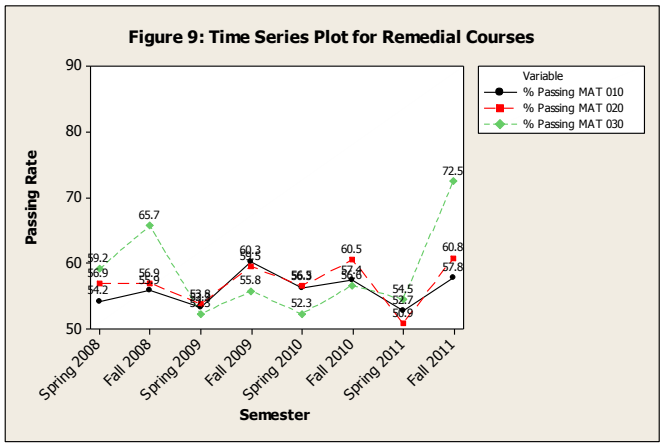


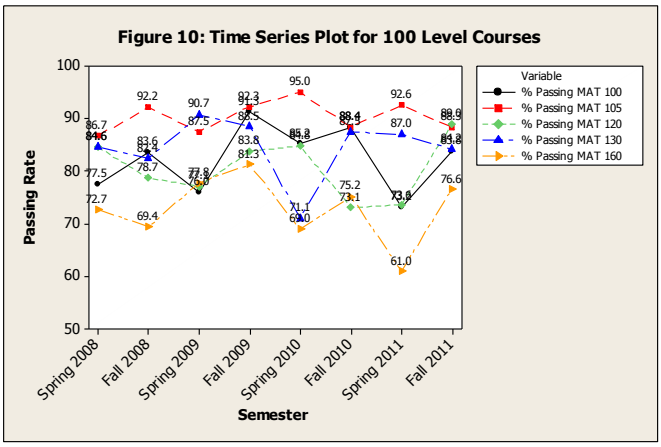
c) PASSING RATES BY GROUP (REMEDIAL COURSES, 100 LEVEL COURSES, HIGHER LEVEL COURSES)

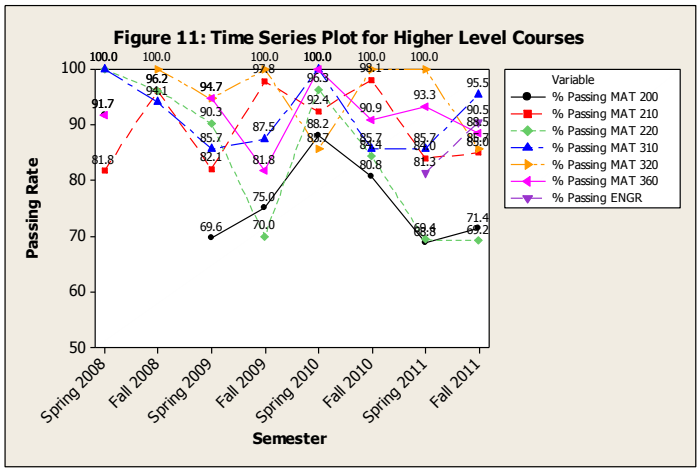
As is true for the retention rates, the passing rates are consistently higher for higher level courses, with some reaching 100% at times. It is noteworthy to point out that for remedial courses the passing rates in the last semester, fall 2011, are higher than those for the first semester in the series, spring 2008. Therefore; even though there are oscillations, one can argue that in general passing rates for remedial courses have improved over the last four years.

The oscillation of the passing rates can be explained as follows:

- In spring 2009, when CUNY determined that COMPASS was going to be used as the exit from remediation exam, we see a clear dropped in the passing rate followed by a significant increase the following semester.
- In spring 2010 CUNY raised the minimum COMPASS passing score from 25 to 30. Once again, after the initial drop in the passing rate, we see an increase the following semester.
- Finally, in spring 2011, the minimum grade to pass the COMPASS exam was once again increased, this time from 30 to 35 for the arithmetic section of the test (*M1*) and from 30 to 40 for the elementary algebra portion of the test (*M2*). The Department believes that this accounts for the decrease in the pass rate during that semester.







**NOTE: The averages in Figure 4 and Figure 5 were calculated based on the semester averages reported by the Office of Institutional Research (OIR), and are not based on raw data. All data is collected and provided by OIR.*

B. Demographic profile of current students in the department's academic program

a) INTRODUCTION

The discussion below considers the demographic profile of students in the Hostos Mathematics Department from the standpoint of (1) academic source (high school, GED, foreign diploma); (2) ethnicity; (3) home language; (4) age distribution; (5) gender; and (6) full-time/part-time status. The tables and accompanying analyses are compiled from data contained in a four-year (seven-semester) look-back performed by the Hostos Office of Institutional Research (OIR) and supplied to the Mathematics Department on February 14, 2012 (see Appendices A and B).

Before addressing data particular to the Mathematics Department, though, it is necessary to say a few words about the demographic profile of Hostos' students generally. Based on data compiled for Hostos' decennial self-study report, we know that students are predominantly Hispanic and black and speak a language other than English at home. For example, by the fall 2010 semester, 120 countries and territories and 78 languages were represented on campus (Hostos Institutional Self-Study Report, 2/12, p. iii). Many students enter Hostos with GEDs or foreign high school diplomas. Close to 90% enter requiring remediation in reading, writing, or mathematics, with 1/3 (about ½ of all such CUNY students) requiring remediation in all three subjects. In the case of mathematics in particular, over 75% of students every semester enter requiring remediation in mathematics (***Appendix A***).

Additionally, a majority of Hostos students come from the South Bronx. The South Bronx is located in the 16th Congressional District, the poorest of the nation's 435 Congressional Districts, with 42.2% of residents living below the poverty line and with households earning less than half of the New York City median household income. More than 34% of residents have less than an 11th grade education, as compared with about 16% of New York City residents overall. Only about 11% of residents of working age possess a higher education degree (associate's degree or higher), compared to nearly 40% of New York City residents overall. Unemployment is almost double that for the city as a whole. More than two-thirds of residents speak a language other than English at home, a fact that often translates into levels of English proficiency making it difficult to find consistent employment (Hostos Institutional Self-Study Report, 2/12, pp. 65-66).

Given these tremendous hurdles to higher education, nearly 40% of Hostos students drop out after their first year. However, the students that remain do well. Those that graduate demonstrate the same level of preparedness as students at other CUNY two-year and many four-year colleges (Hostos Institutional Self-Study Report, 2/12/, p. iii).

b) Academic Backgrounds of Hostos Mathematics Students

The table below summarizes the academic backgrounds of Hostos mathematics students over the four-year period from fall 2008 through spring 2011. As reflected in the table, the data demonstrate the following recent trends:

- Over the past four years, Mathematics Department students have come primarily from New York City. The percentage of students from the Bronx approximately equals the percentage of students from the other four boroughs combined.
- The percentages of students from both groups mentioned above have declined, from 22.8% to 15.4% in the case of the Bronx and from 20.3 % to 16.3 % in the case of the other four boroughs combined.
- The percentage of students from the Dominican Republic has increased from 4% to 7% during the same period, while the percentage of students from other foreign countries has declined from 21% to 10%.

- While the number of students entering with a GED has declined from 19.5% to 14.9% during this period, the number of students entering with a high school diploma has also declined, from approximately 51% to 37% (computed by adding the table's first 4 rows).
- The trends just described are somewhat imprecise, however, in that the percentage of students for whom no data is available on these questions has increased from less than 5% to over 30% during the same period.

Table 1. Demographic Profile of Mathematics Department Students by Entering Degree

Student	Fall 2008		Spr 2009		Fall 2009		Spr 2010		Fall 2010		Spr 2011		Fall 2011	
Background	N	%	N	%	N	%	N	%	N	%	N	%	N	%
NYC public (Bronx)	542	23%	553	23%	577	19%	553	18%	475	17%	490	16%	494	15%
NYC public (outside Bx)	530	22%	503	20%	573	19%	500	16%	441	15%	441	15%	524	16%
Other NYC	22	1%	18	1%	20	1%	14	1%	14	1%	10	0%	12	0%
NYS (non-NYC)	51	2%	67	3%	80	3%	74	2%	72	3%	64	2%	70	2%
US H.S. (non-NY)	77	3%	74	3%	116	4%	109	4%	102	4%	128	4%	108	3%
Dominican Republic	96	4%	99	4%	126	4%	167	5%	157	5%	186	6%	223	7%
Jamaica	4	0%	3	0%	4	0%	6	0%	7	0%	8	0%	9	0%
Other foreign	494	21%	515	21%	507	17%	449	15%	417	15%	373	13%	32.1	10%
GED	465	20%	4861	20%	528	18%	532	17%	459	16%	490	16%	480	15%
Unknown	110	5%	103	4%	465	16%	674	22%	738	26%	793	27%	76	30%
Total	2394	100%	2421	100 %	2996	100%	3078	100%	20882	100%	2983	100%	3217	100%

c) ETHNICITY

Data regarding the self-described ethnicity of Mathematics Department students from fall 2008 through spring 2011 is set forth in Table 2 below. These data show that during that time period:

- The portion of mathematics students describing themselves as Hispanic (including the separate category of Puerto Ricans from fall 2008 through spring 2010) has remained constant at approximately 60%, from 60.5% in fall 2008 to 59.9% in 2011.
- The category of mathematics students describing themselves as black has again remained relatively constant during this period, from 29.9% in fall 2008 to 27.4% in fall 2011.
- The category of students describing themselves as white has fluctuated slightly more, from a low of 1.8% in fall 2008 to a high of 5.8% in spring 2010, falling back down to 2.5% in fall 2011.

Table 2. Self-described Ethnicity of Hostos' Mathematics Students, fall 2008-Fall 2011

Category	Fall 2008		Spring 2009		Fall 2009		Spring 2010		Fall 2010		Spring 2011		Fall 2011	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
White	42	2%	45	2%	161	5%	180	6%	110	4%	80	3%	81	3%
Black	716	30%	710	29%	842	28%	855	28%	726	25%	789	26%	880	27%
PuertoRico	38	2%	50	2%	164	6%	238	8%	No category		No category		No category	
Hispanic	1410	59%	1392	58%	1635	55%	1619	53%	1681	58%	1750	59%	1926	60%
Asian	83	4%	67	3%	94	3%	94	3%	80	3%	69	3%	80	3%
American Indian*	3	0%	6	0%	15	1%	18	1%	15	1%	9	0%	7	0%
Pacific Islander*	No category		No category		No category		No category		3	0%	6	0%	6	0%
Missing*	102	4%	151	6%	85	3%	74	2%	267	9%	280	9%	237	7%
Total	2394	100%	2421	100%	2996	100%	3078	100%	2882	100%	2983	100%	3217	100%

d) HOME LANGUAGE

Table 3 below details the home languages of Hostos' mathematics students over the four years from the fall 2008 through the spring 2011 semester. As shown by the table, the percentage of students who identify their home language as other than English has increased consistently from less than 65 percentage points in the fall 2008 semester to approximately 85 percentage points for the three most recent semesters for which data are available. The change in this important demographic category represents an increase of approximately 31% (85 percentage points minus 65 percentage points equals 20 percentage points, or 31% of the 65 percentage-point starting figure).

Table 3. Home Language of Hostos Mathematics Students, Fall 2008-Fall 2011

Category	Fall 2008		Spring 2009		Fall 2009		Spring 2010		Fall 2010		Spring 2011		Fall 2011	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Other than English	1554	65%	1737	72%	2550	85%	2661	87%	2545	88%	2541	85%	2675	83%
English	246	10%	219	9%	152	5%	146	5%	136	5%	202	7%	286	9%
Unknown	594	25%	465	19%	294	10%	271	9%	201	7%	240	8%	256	8%
Total	2394	100%	2421	100%	2996	100%	3078	100%	2882	100%	2983	100%	3217	100%

e) AGE DISTRIBUTION

Table 4 below sets forth the age distribution of Hostos' mathematics students for the period fall 2008 through fall 2011. The table shows the following points:

- The average student age has dropped progressively every semester, from 28.71 in fall 2008 to 25.05 in spring 2011.
- During this period, there have been slight annual decrements in each age category over 21.

- By contrast, the same period reflects a dramatic increase in students under age 22, from 7.7% to 25.5 percent, or an increase in the under-22 population of approximately 17% (7.7 percentage points for Fall 2008/25.5 percentage points for spring 2011).
- Beginning at least in spring 2011, students under age 18 have matriculated as well.

Table 4. Age Distribution of Hostos Mathematics Students, Fall 2008-Fall 2011

Category	Fall 2008		Spring 2009		Fall 2009		Spring 2010		Fall 2010		Spring 2011		Fall 2011	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Under 18	0	0%	0	0%	0	0%	0	0%	0	0%	3	0%	22	1%
18-21 yrs	184	8%	233	8%	629	21%	731	24%	1018	35%	1085	36%	1469	46%
22-24 yrs	852	36%	866	36%	909	30%	950	31%	721	25%	709	24%	694	22%
25-29 yrs	651	27%	640	27%	677	23%	654	21%	495	17%	515	17%	455	14%
30-34 yrs	307	13%	298	13%	316	11%	321	10%	260	9%	256	9%	252	8%
35-45 yrs	259	11%	250	11%	304	10%	284	9%	253	9%	276	9%	233	7%
Over 45	140	6%	133	6%	161	5%	136	4%	134	5%	139	5%	104	3%
Total	2393	100%	2420	100%	2996	100%	3076	100%	2881	100%	2983	100%	3229	100%
Average	29		28		28		27		26		26		25	

Because younger students may have reduced attention spans and/or decreased motivation, the increase in this proportion of Hostos' mathematics student population has important implications for teaching and learning mathematics. In addition, collateral consequences such as the parental consent required under federal Institutional Review Board regulations for classroom-based research (45 CFR 46.117) become relevant as well.

f) GENDER

Table 5 below sets forth data from the fall 2008 through the spring 2011 semesters regarding the gender of Hostos' Mathematics students. As can be seen from these data, which coincide with the recent recession, the percentage of females has declined slightly from close to 69% to just above 65%. The percentage of males has correspondingly increased from 31% to close to 35%.

Table 5. Gender of Hostos Mathematics Students, Fall 2008-Spring 2011

Category	Fall 2008		Spring 2009		Fall 2009		Spring 2010		Fall 2010		Spring 2011		Fall 2011	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Female	1640	69%	1621	67%	2005	67%	2040	66%	1828	63%	1914	64%	2098	65%
Male	754	31%	800	33%	991	33%	1038	34%	1054	37%	1069	36%	1119	35%
Total	2394	100%	2421	100%	2996	100%	3078	100%	2882	100%	2983	100%	3217	100%

g) FULL-TIME, PART-TIME STATUS

Data detailing the full-time/part-time status of Hostos mathematics students for the four-year period from fall 2008 through spring 2011 is shown in Table 6 below. As can be seen from the table, during this period (which coincided with the recent severe recession), the number of full-time students increased by two percentage points, from under 78% to close to 80%. Correspondingly, the number of part-time students dropped by two percentage points, from just over 22% to just over 20%.

Table 6. Full-time, Part-time Status of Hostos Mathematics Students, Fall 2008-Spring 2011

Category	Fall 2008		Spring 2009		Fall 2009		Spring 2010		Fall 2010		Spring 2011		Fall 2011	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Full-time	1865	78%	1816	75%	2375	79%	2325	76%	2336	81%	2280	77%	2470	80%
Part-time	529	22%	605	25%	621	21%	753	25%	546	19%	703	24%	647	20%
Total	2394	100%	2421	100%	2996	100%	3078	100%	2882	100%	2983	100%	3217	100%

h) SUMMARY

Over the past four years, Hostos mathematics students have come primarily from New York City, with the percentage of students from the Bronx approximately equal to the percentage of students from the other four boroughs combined (approximately 15% in each case). While the number of students with a GED has declined slightly (from 19.5% to 15% during this period), the number of students entering with a high school diploma also appears to have declined, from 51% to 37%. The majority of Hostos mathematics students self-report their ethnicity as Hispanic (at approximately 60%) or as black (at close to 30%). Possibly because the time frame reported coincides with the recent severe recession, the percentage of male mathematics students has *increased* from 31% to 36%, while the percentage of female students has correspondingly *declined*, from 69% to 65%. Similarly, the number of full-time students in the Mathematics Department has risen 2 percentage points over this period (from 78% to 80%), while the number of part-time students has dropped by 2 percentage points (from 22% to 20%).

From the standpoint of teaching and learning, however**, the two most important demographic shifts occurring over the last four years are the number of students who identify their home language as other than English (an increase of approximately 31%), and the number of students in the under-22 age category (an increase of approximately 17%).** Both of these trends impact the difficulty of teaching and learning mathematics and thus hold important implications for the Mathematics Department.

C. Performance on the CUNY Skills Test in Mathematics

a) ENTRY QUALIFICATIONS

Table 1 below reflects the performance over the five-year period from fall 2006 through fall 2010 of Hostos' entering freshmen in the CUNY-wide mathematics placement test (Hostos

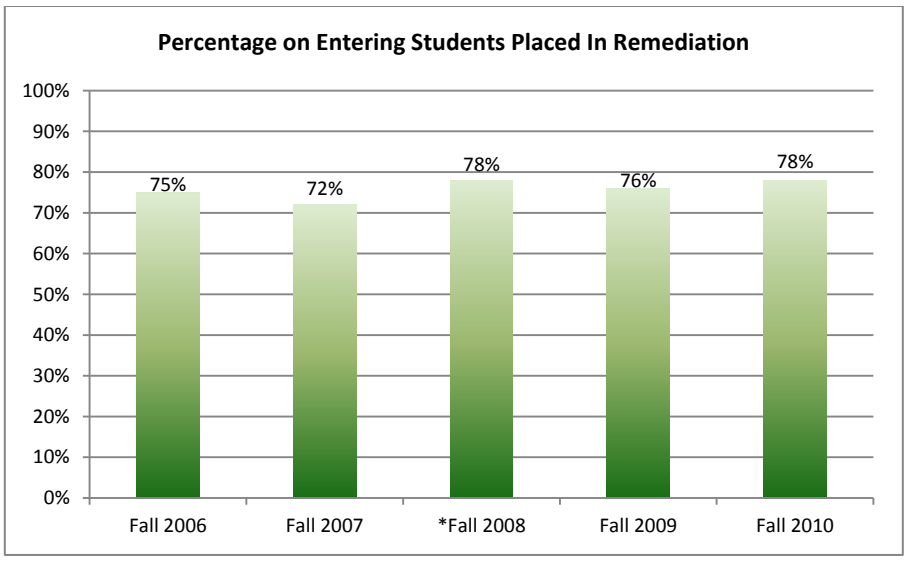
Institutional Self-Study Report, 2/12, ***Appendix*** 9.1, p. 250). As shown by the table, upwards of 75% of all entering students fails the mathematics placement test.

Table 1: Performance of Entering Freshmen on the CUNY Mathematics Skills Test (N=Total Number of Freshman)

	Fall 2006 N =787		Fall 2007 N = 813		*Fall 2008 N = 905		Fall 2009 N = 1178		Fall 2010 N = 1073	
Pass	138	18%	148	18%	106	12%	128	11%	99	9%
Fail	587	75%	585	72%	701	78%	889	76%	841	78%
Exempt	62	8%	79	10%	98	11%	161	14%	132	12%

*In Fall 2008, the passing score on COMPASS Math was increased from 27 to 30 on both parts of the test.

Figure 1: Performance of Entering Freshmen on the CUNY Skills Test in Mathematics-Pass Rate



b) EXIT TEST PERFORMANCE

Moreover, as current best practice measures the success of remediation by students' performance on subsequent college-level tests that enable them to graduate (e.g., http://www.innovativeeducators.org/), this report considers student performance only on the upper level of the COMPASS exit-from-remediation test (the M2), which constitutes the entry criterion necessary to enrollment in the college-level courses necessary to graduation. The relevant data, showing M2 pass-rate status by placement in either of the two exit-test based courses, is summarized in Table 2 below. MAT 010 represents the Basic Mathematics Skills course (arithmetic and pre-algebra), while MAT 020 represents Elementary Algebra, the gateway course to college-level mathematics courses.

Table 2: M2 Exit Test Performance by Course Placement

Course Placement	Fall 2008 N = 1541		Spring 2009 N = 1520		Fall 2009 N = 1944		Spring 2010 N = 2021		Fall 2010 N = 1997		*Spring 2011 N = 2069	
MAT 010	N =1070	76%	N = 1138	75%	N = 1422	73%	N= 1488	74%	N = 1473	74%	N = 1488	72%
	FAIL	PASS	FAIL	PASS	FAIL	PASS	FAIL	PASS	FAIL	PASS	FAIL	PASS
	45%	50%	51%	49%	54%	46%	58%	42%	59%	41%	67%	33%
MAT 020	N = 371	24%	N = 382	25%	N = 522	27%	N= 533	26%	N = 524	26%	N = 581	28%
	FAIL	PASS	FAIL	PASS	FAIL	PASS	FAIL	PASS	FAIL	PASS	FAIL	PASS
	35%	65%	34%	66%	35%	65%	35%	65%	34%	66%	44%	56%

* In Spring 2011 the upper level COMPASS pass score increased from 30 to 40.

Figure 2: M2 Exit Test Performance by Course Placement-Pass rate

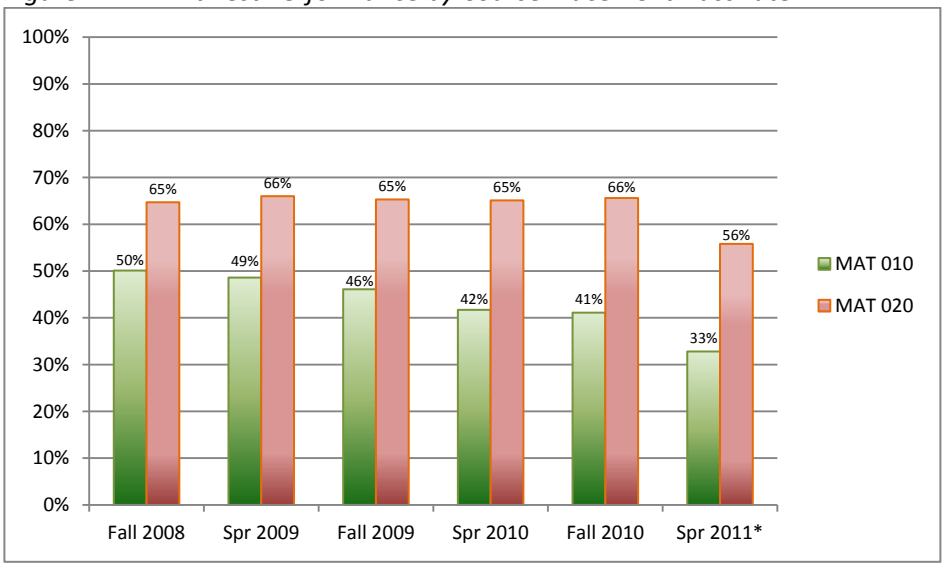


Table 2 and Figure 2 demonstrate the following points:

- Although there has been a slight decrement every semester in the number of students placed in the lower level remedial course (MAT 010), close to three-fourths of entering freshmen every semester are placed in the lower level course.
- Freshmen placed in the lower level course demonstrate a pass-rate on the higher level COMPASS exit test of close to 50%.
- By contrast, approximately one-fourth of entering freshmen are placed in the higher level developmental course (MAT 020).
- Of these freshmen, the pass-rate on the upper-level COMPASS exit test is about 65%.
- Following a spring 2011 increase in the upper level COMPASS pass score from **30** to **40**, overall pass-rates declined by about 10 percentage points, whether for freshmen originally placed in MAT 010 or for those originally placed in MAT 020.

c) CURRENT PRACTICE

A further point needs to be noted. By CUNY prescription, the COMPASS was last mandated as an exit-from-remediation test in the fall 2010 semester. Many CUNY campuses, including Hostos, elected to administer the COMPASS exam on an optional basis during the spring 2011 semester. Again like most other CUNY campuses, the Hostos Mathematics Department declined to offer the COMPASS as an exit-from remediation test during the fall 2011 semester. Instead, students were required to pass the MAT 020 course with a grade of at least 70 (C), with a score on the Mathematics Department final exam of at least 60 and with that exam counting at least 25% of the grade.

Late this January, CUNY issued new elementary algebra proficiency rubrics based on standards set by the United States Department of Education. Beginning in the Fall 2012 semester, students may demonstrate algebra proficiency only by passing a final examination based on questions generated algorithmically from a CUNY data base, with a score of at least 60 on that final and at least 74 for the course overall, counting the CUNY-wide final at 35% (CUNY Math Panel recommendations, revised 2/22/12). However, as the relevant data base has not yet been completed, CUNY colleges are free to apply their current standards for their Spring and Summer 2011 courses, expressly excluding the COMPASS test (electronic communication from Dr. Mona Fabricant, CUNY Mathematics Panel Chair, to Hostos Mathematics Chair Daniel Maysonet, 2/21/12).

D. Student Support and Services

In this section the Department of mathematics will explore the current status of:

- Computer Lab Space for Mathematics students
- Tutorial services provided by the Hostos Academic Learning Center (*HALC*) including:
  - Tutor lead recitation sessions.
  - Walks-in tutorial services.

a) COMPUTER LAB SPACE FOR MATHEMATICS STUDENTS

At the time of the last Mathematics Department Academic Program Review, Hostos Community College had several computer labs that could be used by the Mathematics Department or other departments. These computer labs were equipped with desktop computers that had fast access to the Internet, were extremely reliable and were available to students as soon as they entered the classroom. However, by the fall 2010 semester, the college had dismantled several of these rooms. Since then, student access to computers during class time has been available through portable laptop computers that, when available, are delivered to the classroom.

While there are some faculty members that use computers in every class session, the vast majority of computer technology use is during recitation sessions taught by a tutor. On these days the use of laptops takes up valuable time for distribution and pick up. The Department notes that the laptops are typically delivered on time, but tutors are

frequently late and, for security reasons, laptops cannot be given out until the tutor is present.

As mentioned in ***Section VI. Facilities and Resources*,** on ***page 61***, there are eight *Computers on Wheels* (COWS) available to the entire college community. Of these, only two are reserved for the Mathematics Department. This is insufficient for the entire department. The limited access to computers for student use in class is one of the factors impeding the expansion of the use of math software in several courses within the department.

The lack of dedicated computer lab space presents further issues with mandatory exit from remediation exams imposed by CUNY. Most community colleges in CUNY have computer lab space available for the Mathematics Department to give end of year exit from remediation exams. The math instructor brings his or her class to the lab and testing personnel administers the exam. In our case COWS are brought to the classrooms; however, sometimes the laptops lose connection and/or stop functioning. His result is inappropriate for high stakes final exams. Furthermore, there are not a sufficient number of computers for use on a departmental level. Thus, the exit from remediation final exam must be given at Hostos using pen and paper graded by a Scantron machine. Because the Scantron machine currently available to the Mathematics Department is extremely rudimentary, we have the potential for many errors using this process.

b) TUTORIAL SERVICES PROVIDED BY *HALC*

At the time of the last APR the Mathematics Department was in control of the student tutoring for mathematics. However, about 10 years ago the Office of Academic Affairs (OAA) centralized all tutoring services under the Hostos Academic Learning Center (HALC.) Since then mathematics tutoring has been separated from the Mathematics Department.

At the outset of this reorganization there was a liaison between the Department and HALC hired by and responsible to the Mathematics Department. After three years this position was eliminated. Since that time the Department has not had any oversight of the mathematics tutoring services, including the hiring and training of tutors as well as the review of the quality of the services provided by these tutors.

Tutor lead recitation sessions

At the time the OAA separated math tutoring from the Mathematics Department, each developmental MAT 010 pre-algebra, MAT 020 elementary algebra and MAT 030 intermediate algebra courses had a tutor lead recitation session once a week . These recitation lessons commenced the first or second week of the semester. During the last five years, under a so-called “pilot project,” many sections of these courses do not have a recitation session. This is unfair to students who get different services depending upon which section they are enrolled in. Furthermore, for several semesters during the pilot project even sections with recitation sessions did not receive tutors until the third week of the semester. This situation penalizes our students.

Faculty have experienced numerous issues working with the tutors. These include:

- Tutors are frequently late to the recitation sessions. This result is problematic for all classes, particularly for those sections using laptops.
- The quality of the tutors varies greatly, but the Department has no control or say in who gets hired or remains as a tutor. For example, the tutors are assigned to class sections randomly without regard to faculty input. Thus, when a faculty member guides or instructs a tutor in the methodology expected in the recitation period and a bond develops, faculty requests to have that tutor next semester are frequently ignored.
- When tutors are absent, neither instructors nor students are notified. Such experience can frustrate students and lead to eventual withdrawal from the course.
- The faculty leave material for tutors in the Mathematics Department office for the tutors to use in the tutor session. Such material is often not picked up.
- In order to encourage students to attend the recitation lessons, instructors frequently would like to give quizzes for students during these recitation lessons. However, the HALC administration does not permit this.

Walk-in Tutoring

HALC also offers walk in tutoring for students. This tutoring typically takes place in small groups. Students in the developmental classes complain that they feel intimidated working along with students in higher level mathematics courses. The Department recommends that developmental walk-in students be taught as much as possible in groups with other students at the same level.

c) 20-HOUR WORKSHOPS OFFERED BY HALC

Another service provided by the college is workshops for CUNY mandated exit from remediation exams. These workshops are an invaluable asset to our students however, some of these workshops are offered during the semester when students are enrolled in developmental classes. The department's position is that workshops should be offered between semesters and only to students that have failed the skills test after taking a remedial course as well as to multiple repeaters.

The table that follows shows the passing rates of students registered in developmental courses and students taking the HALC workshops. (Rates have been rounded off to the nearest whole number.) Notice that many students who take HALC workshops do so after taking a semester of remediation and that the workshops' goal is just test preparation.

Comparison of CUNY Skills Test Pass Rates, by Intervention Type (Source: Self-Study Report)

Test	Past Rates: Courses			Pass Rates: HALC-Workshops		
	2008-2009	2009-2010	2010-2011	2008-2009	2009-2010	2010-2011
MAT 010: Pre-Algebra	59	70	69	56	58	53
MAT 020: Algebra	56	63	52	49	51	48

d) RECOMMENDATIONS

In terms of student support and services, the Mathematics Department strongly recommends that:

- A coordinator selected by and responding to the Mathematics Department be designated to supervise all mathematics tutorial services.
- The pilot program in which only some sessions of developmental sections have recitation components be terminated. As stated in the syllabus for each of these sections, all developmental sections should have a recitation component.
- Facilitating student acquisition of portable devices with internet connection and the capability of running mathematics software be explored by the college.
- Student workshops be offered only between semesters and only to students that have failed the skills test after taking a remedial course as well as to multiple repeaters.

V. FACULTY

A. Departmental Profile

The Mathematics Department is composed of faculty who are highly prepared, and able and willing to confront the various challenges that our unique student body presents. The majority of the full-time faculty members have doctoral degrees. All adjunct faculty members have earned one or more master's degrees.

a) NUMBER OF FULL-TIME AND PART-TIME FACULTY

During the time covered by this Academic Review, the Department has been able to secure several new lines as reflected in the table below.

Faculty Status	Number of Faculty	
	Spring 2012	Fall 1997
Full-time faculty	22	13
Part- time faculty	32	33

These numbers show an increase from 13, at the time of the previous Academic Review, to 22 full-time faculty members by spring of 2012, representing a 69% increase. The ratio full-time to part-time faculty has increased from 1:3 to 2:3.

b) ACADEMIC PREPARATION (SPRING 2012)

Full-time Faculty Degree	Number of Faculty
Ed.D.	3
Ph.D.	14
M.A. or M.S.	5
Part-Time Faculty Degree	**Number of Faculty**
Master's Degree	32

c) RANK (SPRING 2012)

More than 91 % of the full-time faculty members of the Mathematics Department have professorial rank. Approximately 97 % of the part-time faculty are Adjunct Lecturers. Only 3% have professorial rank.

Full-time Faculty Rank	Number of Faculty
Professor	4
Associate Professor	5
Assistant Professor	8
Lecturer	2
Substitute Lecturer	3
Part-time Faculty Rank	**Number of Faculty**
Adjunct Lecturer	31
Adjunct Assistant Professor	1

d) YEARS OF SERVICE (FALL 2011)

By any standard, our faculty is an experienced and extremely well-prepared one. The retention pattern of the faculty in the Department is excellent. Fifty-four percent of the full-time faculty members have between 5 and 26+ years of teaching at Hostos, and nearly 63% of the part-time faculty has been teaching at Hostos for a period of 5 to 26+ consecutive years.

Full-time Faculty: Years of Service	**Number of Faculty**
0 – 5 years	10
6 – 10 years	1
11 – 15 years	5
16 – 20 years	3
21 – 25 years	1
26+ years	2
Part-time faculty: Years of Service	**Number of Faculty**
0 – 5 years	10
6 – 10 years	8
11 – 15 years	6
16 – 20 years	4
26 years +	4

e) ACADEMIC WORKLOAD

The teaching load is established by the contract between the PSC and CUNY at 27 contract hours per year for full-time faculty members. In the table given below, the actual numbers of instructional hours being taught by the full-time faculty (excluding released time) in the fall semester of 2011 are given. This corresponds to 38% of instructional hours taught by full-time faculty, making the full-time to part- time ratio 2:3.

In the fall 2011 semester, most of the full-time faculty members, approximately 93%, had two or more course preparations. Fifty percent of the adjunct faculty had two course preparations; the remaining 50% had only one preparation. Fifty-four percent of the full-time faculty had released time for administrative purposes.

Full-time: Instructional hours	**Number of Faculty**
16.5 hours	3
13.5 hours	11
12 hours	2
9 hours	4
4.5 hours	2
Part-time: Instructional hours	**Number of Faculty**
9 hours	13
7.5 hours	3
6 hours	3
4.5	13

f) NUMBER OF COURSE PREPARATION (FALL 2011)

Full-time Faculty: # Preparations	Number of Faculty
Three	4
Two	11
One	7
Part-time Faculty: # Preparations	**Number of Faculty**
Two	7
One	25

g) CLASSIFICATION OF FACULTY ACCORDING TO AFFIRMATIVE ACTION GUIDELINES (FALL 2011)

According to the Underutilization CUNY Affirmative Action Report, as of July 30, 2011, our Department is not deficient in any underutilization category.

Full-time faculty	Number of Faculty
Hispanic	6
Asian	7
White	12
Black	1
Part-time Faculty	**Number of Faculty**
Hispanic	14
Asian	1
White	15
Black	2

h) NUMBER OF FACULTY ABLE TO TEACH IN ENGLISH AND/OR SPANISH (SPRING 2012)

While all faculty in the Mathematics Department can teach in English, 27% of the full-time and 50% of the part-time faculty are also well prepared in terms of ability to teach in Spanish as well. This capability is an asset to our institution.

Faculty Status	Bilingual Faculty (Eng./Spa.)
Full-time	6
Part-time	16

i) NUMBER OF FACULTY WITH RE-ASSIGNED TIME BY RANK (FALL 2011)

Faculty Rank	Re-Assigned Time
Professor	2
Associate Professor	4
Assistant Professor	7
Lecturer	0

j) PARTICIPATION OF THE FACULTY MEMBERS IN THE DECISION MAKING PROCESS, ORGANIZATION AND DEVELOPMENT OF THE DEPARTMENT

The decision on all personnel and budget matters that include hiring, retention, promotion, tenure of all full-time faculty, and hiring and retention of part-time faculty

are handled by the Department Chair and four other Department members, all of whom are elected by the Department according to CUNY by-laws. The Chair and the Deputy Chair, who is appointed by the Chair, handle the day-to-day operations of the department.

The Department also has several committees to represent the department's various course offerings. These committees meet regularly to discuss course issues; manage departmental examinations; update syllabi, course objectives, and student learning outcomes; and are otherwise the go-to faculty for individual course issues. The committees report their initiatives to and work with the departmental curriculum committee for further insight. Virtually all fulltime faculty is on one or more committees, giving everyone ownership and a personal voice in all curriculum related issues.

All issues concerning curriculum are the purview of the Department Curriculum Committee, which consists of all full-time teaching members of the department. This committee also has various subcommittees that periodically make curriculum recommendations. However, it is the responsibility of the Department Curriculum Committee to make all final recommendations regarding curriculum. The Mathematics Department then votes on the recommendations made by the Curriculum Committee.

The Department also has course coordinators for MAT 010, MAT 020, MAT 030, MAT 120, MAT 160/Calculus who make sure that all faculty members teaching these courses receive all the necessary information. In addition, this committee regularly revises the syllabi, recommends required textbooks, and develops learning outcomes. As explained in the *Outcome Assessment* section of this report, the Department has placed an emphasis on assessment. The MAT 010 and MAT 020 curriculum sub-committees have collected data to assess whether the learning outcomes have been reached.

k) SERVICE TO THE INSTITUTION

As reflected in their participation in departmental and college-wide committees, the faculty members of the Department have a long history of service to the institution. For the purpose of this review, the information provided in this statement reflects only contributions made since the fall of 2011. The data presented here was obtained from the responses to a questionnaires developed by the Mathematics Department Academic Review Subcommittee on Faculty. At the Department level, the data shows that there is ample participation by the faculty in the operation, organization, and development of the Department. To ensure this participation, the Department has organized itself into committees and subcommittees according to the tasks that are to be accomplished. Most recently, the Department has formed subcommittees to accomplish the Academic Review that is this report.

Among the numerous tasks that the faculty in the Department performs, each full-time member participates in either registration or academic advisement during registration or both. Some members of the Department are members of the Academic Advisement Committee and five are advisors for the Engineering students.

At the College-wide level, the Department has an impressive record of participation. Besides performing duties in registration every semester, members of the Department participate in at least twenty-five College-wide committees. It is important to note that the participation in these committees in many instances is in a leadership role as several members of the Department have served as chairpersons of some of these committees. The table that follows shows the participation of the faculty in different committees.

College-Wide Committees	**Fall 2011**
Hostos Senate	6 (Nearly 14% of the faculty senators)
Executive Committees Hostos Senate	1
P & B	2
Curriculum Committee	1
Instructional Evaluation Committee	1
Election Committee	5
Academic Advisement	Regular participation of Math Faculty
Student Club Advisor	4
Student Election review	1
Institutional review	8
Search Committees	Regular participation of Math Faculty
Committee on Academic Computing	1
Academic Standards Committee	1
Discipline Committee	1
Graduation Committee	1
Committee on Committees	1
Reaccreditation Committee	1
POINT Committee	1
CUNY-wide Committees	**Fall 2011**
Mathematics Discussion Group	5
Council of CUNY Math Dept. Chairs	1
CUNY Pathway Task Force	2
CUNY Math Panel	2

l) RESEARCH, CREATIVITY AND PUBLICATIONS

The areas of research in the Department are quite varied and include applied and pure mathematics, mathematics education, Internet technology, mathematical physics, algebra, topology, number theory, and combinatorics.

As a complement to the teaching that comprises the major portion of the creative work contributed by our faculty, a number of projects have been undertaken that belong in this category.

They range from the annual issue of a mathematics journal to the preparation of a variety of materials designed for use in a classroom setting to more elaborate presentations for electronic media, or simply the treatment of more global issues within the field of Mathematics Education.

Please go to ***Appendices B-C*** for a detailed description of faculty accomplishments in this area.

m) PROFESSIONAL DEVELOPMENT, ACHIEVEMENTS, HONORS AND CONFERENCE PARTICIPATION

The faculty of the Department keeps abreast of the developments in their fields of expertise. Most of the faculty members during these past three years have attended workshops, presentations and/or conferences dealing with the use of technology in the classroom, mathematics and/or mathematics education. These professional development activities have been conducted at the College, at CUNY, or at the national/international level.

At the departmental level there has been support for conference participation and for faculty development initiatives in collaborative learning. One salient point is the yearly publication of the HCC Mathematics Journal. At the college-wide level, the faculty participates in OAA faculty development activities and also in OAA grant writing.

Outside the College, professional development has been achieved through attendance in activities sponsored by the CUNY Mathematics Discussion Group; the University Faculty Senate; the CUNY Graduate Center; the CUNY Open System Center; other CUNY institutions; and national and international conferences.

Please go to ***Appendix D*** for a detailed description of the faculty accomplishments in this area.

B. Summary of Recent Professional Accomplishments

The Department has experienced an increase in scholarly activity. While in part due to the policy on Tenure and Promotion developed by the College about five years ago, this increase is also due to the hiring of a significant number of faculty in the early and middle stages of their career.

The departmental component of the policy on Tenure and Promotion provides incoming faculty with a clearer idea of departmental expectations.

The recent professional accomplishments of all current members of the Hostos Mathematics Department are set forth in ***Appendices B, C, and D***, which summarize recent publications, presentations and awards. Grants are discussed in more detail immediately below.

GRANTS

Funding for Mathematics Department grants comes from several sources. External funding sources include independent entities such as the Ford Foundation, the National Aeronautics and Space Administration (NASA), the United States Department of Education, and the New York State Department of Education. Other funding comes from the Professional Staff Congress (*PSC*) and the City University of New York (CUNY), primarily through the Research Foundation, an independent tax exempt organization which oversees the implementation of all federal, state, city, and private funds received

by CUNY's various units (www.rfcuny.org). Funding specific to Hostos to generate innovations in classroom teaching originally came from a five-year federal grant awarded for the period from 2003 through 2009 under the Higher education Act of 1965. This grant resulted in the creation of the Hostos Committee on Beautiful Ideas (*COBI*), which has offered small grants with a view to curriculum innovation.

a) EXTERNALLY-FUNDED GRANTS

One of the five goals of Hostos' new 2011-2016 Strategic Plan is the integration of academic programs, extended learning, and support services, including an initiative to rethink basic skills training and developmental education (http://www.hostos.cuny.edu/strategicplan/). In furtherance of such restructuring, the President's Office secured from the Ford Foundation a grant dedicated in part to funding a mathematics remediation consultant recommended by the John N. Gardner Institute to inform the mathematics restructuring process through best practices research. This grant is also funding faculty conference and site visits to secure familiarity with successfully remodeled developmental mathematics programs. As over 75% of Hostos' students enter requiring remediation in mathematics (see discussion of student profiles), success on this front is paramount to the retention and graduation of Hostos' population.

Additional grants have been won directly by Mathematics Department faculty. Under the auspices of Professor Nieves Angulo, Hostos currently is carrying out two different externally-funded grants designed to support the persistence and graduation of community college students in STEM-related disciplines. The first, a three-year NASA-funded collaboration between Hostos and the New York City College of Technology starting with the Fall 2010-Spring 2011 academic year, focuses on curricular improvement and seminars at the two schools, both minority-serving institutions. In addition, the grant, which provides close to $150,000 per year to be split between the two institutions, makes available summer internships at NASA's Marshal and Goddard space centers for selected students. Two Hostos students completed such internships during the summer of 2011.

The second STEM-related grant, for which Professor Angulo is again the Co-PI, was awarded in October 2011 by the U.S. Department of Education's Alliance for Continuous Innovative Learning Environments in STEM (CILES) for the five-year period ending in September 2016. This grant, which awarded $4 million to be allocated among three CUNY institutions (The City College of New York, La Guardia Community College, and Hostos), calls for improving articulation (transfer) agreements with City College in the environmental sciences, computer engineering, and bio-medical engineering; improving the community college laboratories supporting those agreements; and creating virtual learning environments where City College students can tutor Hostos STEM students online.

Another grant that is important to mention is the *Perkins Grant*. Pursuant of this grant, our institution receives more than $1 million dollars every year. For the past 7 years the

PI for this grant has been V.P. Carlos Molina. Professor Loreto Porte has been the Director of *Major Effort 2* or *3* (with the exception of the year 2010) which deals with *Academic Improvement.* Through this grant, the Mathematics *Department* has been able to implement a number of important projects, including the use of mobile technology in some developmental classes, the development of websites to support preparation for COMPASS, the development of website for MAT 010, the use of *MathXL* in some developmental classes and the development of hybrid and asynchronous courses within the department. Other College-wide projects supported through this grant under the leadership of Professor Porte include the establishment of a strong faculty development program to support faculty to integrating technology to improve teaching and learning, the conversion of traditional courses to hybrid and asynchronous mode, and the enhancement and development of interactive online tutorials for CPE, ACT, and COMPASS Math.

Additional externally-funded grants won by Mathematics Department faculty members since 2005 are summarized in the table below.

Table 1. Externally Funded Grants: Summary of Awards for Past 5 Years
Mathematics Department
(Source: Hostos Grants Office, 11/16/11)

Title	Sponsor	Award	Project Period	PI/Co-PI/Director
2006-2007				
Bridges to Engineering Success for Transfers	NSF / City College	$75,000	10/1/05-9/30/09	PI: VP C. Molina Prof. N. Angulo
ME2: Academic Improvement Trough Technology	US DoE: Perkins	$201,926	7/1/06-6/30/07	PI: VP C. Molina Director ME 3: L. Porte
Science and Technology Entry Program	NYSED	$179,587	7/1/06-6/30/07	L. Porte M. Koffi
Proyecto ACCESS	University of Texas	$10,275	6/01/06-8/31/06	L. Porte M. Koffi
2007-2008				
ME2: Academic Improvement Trough Technology	US DoE: Perkins	$262,898	7/1/07-6/30/08	PI: VP C. Molina Director ME 3: L. Porte
Science and Technology Entry Program	NYSED	$184,982	7/1/07-6/30/08	L. Porte M. Koffi
2008-2009				
ME2: Academic Improvement Trough Technology	US DoE: Perkins	$188,039	7/1/08-6/30/09	PI: VP C. Molina Director ME 2: L. Porte
2009-2010				
ME2: Academic Improvement Trough Technology	US DoE: Perkins		7/1/09-6/30/10	PI: VP C. Molina Director ME 2: L. Porte
2010-2011				

Explicit Solution to DEA Problems with a Perfect Object	PSC-CUNY	$3,325.00	7/1/10-6/30/11	A. Vaninsky
Achieving Proficiency in Engineering…	NASA/CIPAIR-CityT	$149,156	9/7/10-9/06/13	Co-PI: N. Angulo
2011-2012				
ME2: Academic Improvement Trough Technology	US DoE: Perkins	$304,236	7/1/11-6/30/12	PI: VP C. Molina Director ME 2: L. Porte
The Alliance for Continuous Innovative..	US DoE: City College	$4,0077,121	10/1/11-9/30/16	Co-PI: N. Angulo

b) TAX LEVY GRANTS

Grants supported by CUNY funding over the past five years are summarized in Table 2 below. Significant projects include the 2007 "Do Math" grant awarded to Professors Violeta Menil and Olen Dias to support active problem solving in enhancing remedial mathematics learning. Among other things, their research demonstrated the effectiveness of assigning interactive homework (using Pearson Publishing's *MathXL*), rather than relying on passive absorbtion, to encourage students to perform class-related homework problems. Thanks to their research, this homework tool, which makes available step-by-step instructions to students needing additional support, has since been adopted by most full-time and many adjunct instructors in the Department.

This research was corroborated and expanded by Dr. Alice Cunningham and Professor Olen Dias pursuant to their 2009 CUNY Central grant for *Improving Undergraduate Mathematics Learning.* Working with 530 students in 18 sections in both of Hostos' exit-test based developmental mathematics courses, Basic Mathematics Skills and Elementary Algebra, the Cunningham/Dias team established the superiority in terms of both performance and attendance in using interactive online homework tutoring support rather than pencil-and-paper exercises in these courses' Math Lab classes (the one class of four each week taught by Learning Center tutors rather than by Department instructors).

Professor Violeta Menil's grant, exploring the use of manipulatives to enhance remedial mathematics learning, also was awarded pursuant to the *Improving Undergraduate Mathematics Learning* initiative. Of the 26 full proposals for this initiative received by CUNY Central, only ten were granted, with the two described above going to Hostos.

Table 2. Tax Levy Grants During Past Five Years
(Source: Hostos Budget Office, 12/5/11)

Year	Name of Grant	Amount	Person in Charge
2007	"The Effectiveness of the "Do Math" Approaches - The Bridge to Close the Cognitive Gap Between Arithmetic And Algebra"	$24,520	Violeta Menil (PI) and Olen Dias (Co-PI)
2011	CUNY Community Collaborative Incentive Research Grant Program	$24,383	Bronislaw Czarnocha
2009	Improving Undergraduate Mathematics Learning: The effect of Small-Group Homework Tutoring on Remedial	$38,453	Alice Cunningham (PI) and Olen Dias (Co-PI)

	Mathematics Learning		
2009	Teaching Pre-Algebra and Algebra Concepts to Community College Students Through the use of Virtual Manipulatives	$54,024	Violeta Menil (PI) and Eric Fuchs (Bronx CC) (Co-PI)

c) COBI GRANTS

The four grants awarded to the Mathematics Department under the COBI initiative are shown in Table 3 below. Topics involved developing new courses or studying teaching approaches.

Table 3. COBI Grants Awarded to Mathematics **Department**

Year	Name of Grant	Purpose	Amount	Person in Charge
2009	Teaching Remedial Mathematics Through Sense-Making Strategies	Exploration of pictorial teaching approaches	$1000 each	A. Cunningham; O. Dias
2009	Mathematics in Motion	College-wide math puzzle posters similar to subway "Poetry in Motion"	$1000 each	B. Czarnocha; J. Kennis
2008	Problem-Solving Course in Mathematics	Non-standard curriculum for required or elective college-level	Release time	K. Doyle; R. Ye
2008	Development of "mathematical structures of music" course	Study of mathematical ideas behind music perception to bridge math and music education	Release time	A. Bird, A. (Humanities); A. Vaninsky

d) PUBLICATIONS AND JOURNALS

In terms of written scholarship, the Mathematics Department provides a home to two journals, as well as to faculty members with multiple individual publications.

Hostos-Based Journals

Since 1986, under the leadership of Professor Terrence Brenner, the Department has published the *Hostos Community College Mathematics Journal* every spring. This annual journal provides a venue for sharing grant applications, articles, and other writings of the Department's members during that academic year, thus keeping faculty apprised of ongoing scholarship in the Department. In addition, under the chief editorship of Professor Bronislaw Czarnocha, the Department functions as the home base for the *Mathematics Teaching-Research Journal (MTRJ)*, www.hostos.cuny.edu/departments/math/mtrj, a peer-reviewed teaching practice and research journal published jointly by the Bronx Colleges of the City of New York (Hostos and Bronx Community Colleges, and Lehman College).

Peer-Reviewed Journal. In existence since the fall of 2009, *MTRJ* is published jointly by Professor Czarnocha of Hostos, Professor Vrunda Prabhu of Bronx Community College and Anne Rothstein of Lehman College. The journal addresses any aspect of the practice and

theory of teaching research, including: general comments about mathematics education; teaching practice; and reports of teaching research investigations. Articles by the Hostos Mathematics Department faculty include: "Are 26 Methods to Solve a Trigonometric Identify enough?" by Terence Brenner (vol. 4(4), June 2011) "Problem-solving and remedial mathematics," by Professors Czarnocha, William Baker, and Olen Dias (vol. 3(4), December 2009); "The Transitions from Pre-algebra to Algebra; Learning Theories-Based Instructional Tasks," by Professors Baker and Czarnocha (vol. 3(1), December 2008); and "Using Clinical Interviews with Low-Performing Students in Mathematics," by Professor Violeta Menil (vol. 3(1), December 2008).

Mathematics Department Journal. Recent articles include: "When the Angles of a Triangle Add Up to Less than π: A Glimpse into Hyperbolic Geometry," by Dr. Ross Flek (Spring 2011); "Kaprekar constant revisited" (Spring 2010) and "Theorem on four Circles Kissing Each Other Consecutively" (Spring 2009), both by Dr. Tanvir Prince. Recent winning grant proposals published in the *Journal* include: "Problem Solving Course in Mathematics" by Drs. Kathleen M. Doyle and Riuli Ye, and Hostos Summer Mathematics Camp, by Professor Olen Dias and Dr. James Kennis. A list by category of all articles published in the *Mathematics Journal* since 2006 years can be found in ***Appendix B***.

Individual Publications. In recent years, the Mathematics Department has been prolific in publications both in the engineering and in the teaching-learning domain. Two examples are Professor Alexander Vaninsky in the case of engineering, and Assistant Professor Alice Cunningham in the case of teaching-learning research.

Professor Vaninsky. Since fall 2008 alone, Professor Vaninsky has published16 articles. Among the most significant are: (1) "Theory of Fractions in a College Algebra Course" (2011), published in *Proceedings of the World Academy of Science, Engineering and Technology (WASET)*; (2) "Explicit Formulas for Efficiency Scores and Weight Coefficients in DEA problems with a Perfect Object" (2011), published in *International Journal of Mathematical Modeling, Simulation and Applications (IJMMSA)*; (3) "Algebraic Trigonometry" (2011), published in the *International Journal of Mathematical Education in Science and Technology*; (4) "Prospective National and Regional Environmental Performance: Boundary Estimations Using a Combined Data Envelopment-Stochastic Frontier Analysis Approach" (2010) published in *Energy*; and (5) "A Dea-Cascor Model for High-Frequency Stock Trading: Computational Experiments in the U.S. Stock Market" (2010), published in *International Journal of Next-Generation Networks.*

Dr. Cunningham. In her 3-1/2 years at Hostos, Dr. Cunningham has published a book and six articles. The book, *Classification and Identification of Mathematics Learning Disabilities: Legal and Research-Based Analyses* (2010), represents an expanded and updated version of her 2007 doctoral thesis. The book was published by Lambert Academic Publishing, an international scientific publishing house, at their invitation without initiation by the author based on the publisher's research at Columbia University Teachers College. Other significant publications since Dr. Cunningham's arrival at Hostos include: (1) a summary of the final results of her *Improving Undergraduate Mathematics* grant from CUNY Central,

"Mathematics is not a Spectator Sport: The Effect of Online Homework Completion Tutoring on Community College Remedial Mathematics Performance" (2011), written with the assistance of Professors Olen Dias and Nieves Angulo and published in the Fall Technology Issue of *Journal of Mathematics Education at Teachers College*; and (2) a summary of student responses to a questionnaire regarding teaching methods in her developmental algebra course, "Teaching Remedial Mathematics for Conceptual Understanding: Student Response" (2011), published in the *MathAMATYC Educator*.

Full citations for articles discussed in this section, as well as additional articles published, presentations made, and awards won by all faculty members in the Department, can be found in ***Appendices C**, and **D***.

C. Faculty Development Activities within the Department

Mathematics Education Seminars of the Mathematics Department were initiated in the fall of 2007 and are continuing until present, averaging 2 to 3 seminars per semester. In 2009 these seminars were expanded to include mathematics presentations. The seminars are a forum for the members of the Department to share their professional successes, presentations and concerns.

Sample titles:

- N queen - a classical problem in the "Mathematics of chess board"
- Learning Trajectories
- Investigating the Effectiveness of *MathXL* platform in preparing Hostos' students for the Compass Exam,
- The paradox of the unexpected exam
- How to improve teaching of Remedial Courses
- Hostos Second Annual Problem Solving Seminar
- Reports from Grants Awarded to the Faculty of Mathematics Department
- Issues of Teaching and Learning in Mathematics Department

D. Effectiveness in Teaching

The evaluation process followed by the Department is determined in large part by the CUNY by-laws, the PSC contract and the Hostos Charter of Governance. There are three forms of evaluations: the annual evaluation conducted by the chairperson, the semi-annual classroom observations, and the student evaluations.

a) ANNUAL EVALUATION

Once a year all faculty members, are evaluated by the chairperson. This evaluation is based on the Activity Report completed by the faculty member, the classroom observations and the student evaluations. The departmental component of the policy on Tenure and Promotion, mentioned before, provides incoming faculty with a clearer idea of departmental expectations.

b) CLASSROOM OBSERVATIONS

With the exception of full professors, each faculty member is observed at least once a year by a colleague of the same or higher rank or by the chairperson. The observation report encompasses a wide variety of features including pacing, organization, clarity and accuracy of the presentation, student participation, and effectiveness of the lesson. This document is one of the bases used for annual evaluations. The Department considers classroom observation a collegial process in which observer and observee have a chance to enrich each other through the sharing of ideas and different ways of teaching.

c) STUDENT EVALUATIONS

This item was discussed at length on *page 26* under *II.E: Student Evaluations for Course Improvement*

VI. Facilities and Resources

A. Overview of non-faculty staff and Budget

The Mathematics Department employs one full-time secretary and two part-time college assistants. Their duties include assisting the Department Chairperson and the Deputy Chairperson in processing information for the instructional staff of the Mathematics Department and the students. In addition, the Department also has a variable number of work study students who are able to assist the secretary and college assistants with some, but not all, of their duties.

a) NON-FACULTY STAFF IN *DEPARTMENT OF MATHEMATICS*

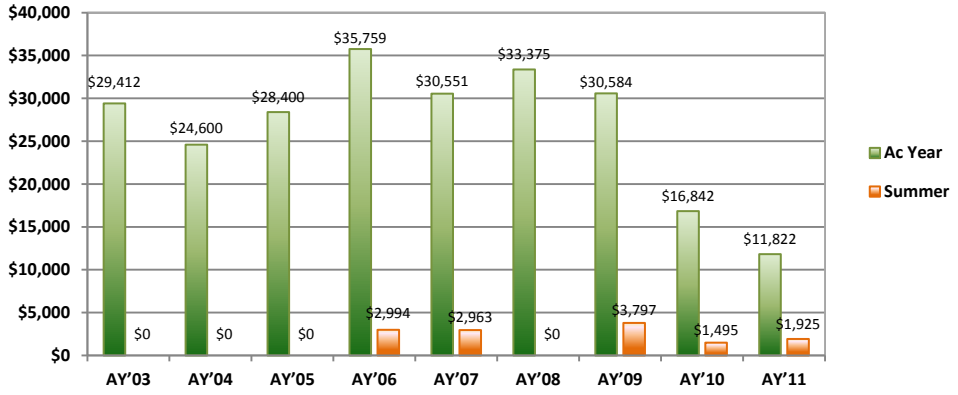
Semester	AY 2006		AY 2007		AY 2008		AY 2009		AY 2010		AY 2011	
	Fall	Spr.	Fall	Spr.	Fall	Spr.	Fall	Spr.	Fall	Spr.	Fall	Spr.
# CUNY Assistants	1	1	1	1	1	1	1	1	1	1	1	1
# College Assistants	3	3	3	3	3	3	3	3	3	3	3	3
# Work Study Students	N/A	4	8	6	5	3	3	5	3	3	9	7

b) THE BUDGET: PERSONNEL (PS)

Due to recent budget cuts, the Department has lost funding for college assistants. Since our Secretary and College Assistants are the first line of information for our students, and in light of the significant increase in student enrollment and in the number of full-time faculty, this loss creates hardship for the Department.

Consider the difference between the AY 2006 and AY 2011 shown in the table given below. In 2006, the Department had a budget of $35, 759 for 3 college assistants. By contrast, in 2011, the budget for three college assistants was only $11,822. The current budget is barely enough for one college assistant at the AY 2006 rate.

College Assistants Budget



The budget for work-study students is completely independent of the budget in the Mathematics Department and Office of Academic Affairs (OAA). Because work-study is a form of financial aid that is offered to students who fit the criteria that set by the Federal Financial Aid program, the number of work study students fluctuates depending on how many students are eligible for that particular type of financial aid, not on the department's needs. Work-study students available to work in the Mathematics Department must be supervised, which takes time from our Department secretary and college assistants. Further, since they are students, they are not able to handle confidential files or exams. The department would benefit from an additional full time secretary who is able to perform all of the required tasks that go into supporting the Department's faculty and students.

c) BUDGET: OTHER THAN PERSONNEL (OTPS)

Considering supplies, such as paper, markers, chalk, toner, the Department is underfunded. The funding for supplies comes from OAA which divides a budget of $10,000 among all departments within the division. The Mathematics Department secretary is responsible for making purchase orders through Stapleslink, and these orders must be pre-approved by OAA. The approvals of these requests are sometimes delayed or not granted. The area of supplies is certainly one where we require better support from the Office of Academic Affairs.

B. Adequacy and appropriateness of library facilities and collections for academic program

The library at Hostos Community College won the Association of College and Research Libraries award for Excellence in Academic Libraries in 2007. This award is exceptionally prestigious and reflects the level of services and resources available to the students at Hostos. In addition to helping students, the library also maintains a liaison to each Department so that faculty members are able to be involved with choosing library resources and requesting such resources for use in their courses. Every required book in the Department is *in reserve* in the library.

C. Space (including office, classroom and other space)

Office space is currently inadequate for the needs of the department. As part of the college's Master Plan, the fourth floor of the B building, where the Mathematics Department is housed, is slated to undergo renovations beginning in January 2013. These renovations are expected to take less than a calendar year to complete. The contractors and architects have already met with the Department Chair to develop an appropriate plan for the renovation that fits the needs of the Department.

The blue print for the remodeled Mathematics Department was first made available to the faculty in spring of 2012. According to current plans,

- The department will fewer square-feet than we currently have. The reduction is significant.

- Faculty are grouped at five per office. This situation is anomalous not only at Hostos but at any other college that the faculty has had the opportunity to visit.
- The number of square-feet per faculty in the offices has been reduced to 92 square feet, far lower than the 120 square feet recommended by the Professional Staff Congress (*PSC*).

The Department strongly feels that this is an unfair treatment of the faculty and that the current remodeling plan should be revisited.

In addition, classroom space is limited due to increasing enrollment. While some classroom improvements have been made, others are inadequate. Classrooms are often packed to their limit.

D. Equipment and laboratories

The equipment used in the Mathematics Department ranges from chalk to laptop computers. Each full time faculty and staff member has a computer and telephone. Computers are also available in the adjuncts' room. The Department owns or leases five printers, one Scantron machine, one projector and one fax machine.

Technology is one very important component of courses in the Department. The Departmernt has various resources available through the Library, Office of Academic Affairs as well as the Office of Information Technology. A brief overview of these items in the Mathematics Department is:

- Personal Digital Assistants (PDAs): 135 available for loan. Mainly used in remedial courses.
- Graphing Calculators: 181 available for loan. Used in upper division courses, *MAT 120: Statistics* and higher.

The following items are available to the faculty through the college, reservations are required in advance

- Laptops: there are 8 "*Computers on Wheels*" (COWs) that can be reserved and delivered to any classroom by making a reservation.
- Multimedia: there are 8 multimedia carts available
- Computers: the college has 16 computer classrooms
- Software licenses: We currently have 300 *MathXL* licenses for student use which was funded by a Perkins grant. The college also maintains site licenses for *SPSS* statistical software, *MATLAB*, *Maple* and *Mathematica*.

Although many faculty members have used the software *MathXL* in their courses, the college has not committed to the purchase of licenses on a consistent basis so that this resource be available to all students. Our students consistently pay a technology fee as part of their tuition and fees at the college. They should have access to this technology just as consistently. For the 2012 academic year, the college will fund the purchase of 500 *MathXL* codes which is a significant academic support for our students.

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