Acknowledgments

The Third Annual Innovative Practices in Developmental Mathematics Conference (IPDM - 2018) would not have been possible without the contributions and support of many colleagues. We are pleased to express our gratitude to:

Dr. Gail O. Mellow, President, LaGuardia Community College, for her devotion to professional development, and for her efforts to engage faculty in rich and fruitful dialogues focused on effective pedagogies.

Dr. Paul Arcario, Provost and Senior Vice President for Academic Affairs; Dr. Bret Eynon, Associate Provost and Assistant Vice President for Academic Affairs; Dr. Ann Feibel, Dean for Academic Affairs and Associate Provost; and Eric Hofmann, Assistant Dean for the Center for Teaching and Learning, who provide leadership and support for exploring new approaches to curriculum, pedagogy and professional development.

Dr. Abderrazak Belkharraz, Chair of the Mathematics, Engineering, and Computer Science Department, whose interest in providing students with new and accelerated pathways through developmental mathematics has been instrumental to our efforts to both improve our pedagogies and provide our students with opportunities for success in mathematics and beyond.

Our Keynote Speakers: Dr. Tara Parker, for engaging us in thoughtful discussions about how appropriate redesign of developmental education may help us achieve racial justice and equity; and Distinguished Professor Michio Kaku for helping us rethink our approaches to reforms for “the next 20 years.”

Our Distinguished panelists, Dr. Andrew Hacker, for discussing algebra needs for students with diverse backgrounds and majors, and alternatives to STEM Majors, and Dr. Edward Rubio for elucidating how data can inform us about college readiness, the effectiveness of placement tests, in an effort to achieve equity in completion.

Vita Rabinowitz, Executive Vice Chancellor, and David Crook, University Associate Provost for Academic Affairs at CUNY Central office for their assistance with publicizing our conference across all CUNY campuses. Sarah Truelsch, director of Policy Research at CUNY Central office for her help with organizing the fishbowl/panel.

The staff of the Mathematics, Engineering, and Computer Science Department and the LaGuardia Center for Teaching and Learning who work very hard to ensure smooth operations. Special thanks to Abdellah Ait Elmouden (MEC) for designing the conference website, and to Priscilla Stadler (CTL), designer of the conference program.

The IPDM Organizing Committee Abdellah Ait Elmouden, Emaan Abdul Majid, Hassan ElHouari, Nana Osei Bonsu, Reem Jaafar, and Sandra Sze.

Karen McKeon and the Events Office staff without whose expertise, generosity, and active involvement, this conference would not succeed. We thank them for their efforts on our behalf.

Our colleagues in Buildings and Grounds, the LaGuardia Print Center, and Media Services whose daily labor contributes to the well-being of us all, and whose extra efforts for this event have been crucial.

Primary funding for this conference was provided to LaGuardia by the Developing Hispanic-Serving Institutions Program - Title V of the U.S. Department of Education. We are pleased to have an opportunity to thank the Department and the Title V program for their generous support.
Algebra with additional support. The results of this implementation have been encouraging; the presentation will shed light upon challenges from registration to retention, and outcomes in the first year of implementation, given the alterations to the placement test.

DEVELOPING CO-REQUISITE COURSES: INTERMEDIATE ALGEBRA AND PRECALULUS - ROOM M138
Jae Ki Lee, Liana Erstenyuk, Hong Yuan, Susan Licwinko, Mathew Meangru (all from Borough of Manhattan Community College)
At BMCC, the path to a STEM major is through completing Intermediate Algebra and Precalculus in two semesters. This presentation demonstrates the development of the first co-requisite course for STEM majors, including the syllabus, workbook, and report on student progress using an online platform.

3:15-3:25 Coffee Break
Skylight Area near Little Theater

3:30-4:30 Fishbowl
Little Theater
Featuring Distinguished Panelists
Dr. Andrew Hacker and Dr. Edward Rubio

4:30-5:00 Celebration
Skylight Area near Little Theater

Conference Overview

LaGuardia Community College is excited to host the Third Innovative Practices in Developmental Mathematics Conference.

The aim of this conference is to bring together experts and practitioners in the field of developmental mathematics to discuss best practices that address students’ needs holistically.

This year’s conference focuses on diversity and equity, and how to close the achievement gap. One of our Keynote Speakers, Dr. Tara Parker, will discuss why it is important to elucidate the role of race and ethnicity in developmental education when designing curricula and pedagogical strategies. Distinguished Professor Michio Kaku will help us rethink our approaches to reforms for “the next 20 years.”

Our Distinguished Panelists bring their valuable perspectives to our dialogue. Dr. Andrew Hacker will engage us in understanding students’ algebra needs and how that might determine equity in completion, and Dr. Edward Rubio will help us to rethink how data can be used to inform the decision-making process in an effort to close the achievement gap.

As you go through the program, you will see that the talks cover a wide range of topics from co-requisite reforms to contextualizing the curriculum, to the use of Open Educational Resources, to the role of Supplemental Instruction in boosting students’ success in developmental mathematics and beyond.

This is the third year that LaGuardia is hosting the IPDM conference. We have tremendously benefited from all participants’ perspectives for the past two years. We all share a common goal: providing all students pathways for success at minimal costs.

We hope to continue the conversation about reforms surrounding developmental mathematics at CUNY and beyond. Future conferences may focus on the impact of reforms at CUNY for the past five years and whether reforms helped achieve equity and student success.
Dr. Michio Kaku is a theoretical physicist, futurist, and popularizer of science; he is a professor of theoretical physics at the City College of New York and the CUNY Graduate Center. Kaku has written several books about physics and related topics, has made frequent appearances on radio, television and film, and writes online blogs and articles. He has written three New York Times best sellers: Physics of the Impossible (2008), Physics of the Future (2011), and The Future of the Mind (2014). Kaku has hosted TV specials for the BBC, the Discovery Channel, the History Channel and the Science Channel.

Dr. Tara Parker’s research focuses on higher education policy related to access and equity for historically underrepresented groups, particularly students of color. She is especially interested in the ways policies concerning remedial and/or developmental education inform and determine post-secondary opportunities and outcomes. She has authored journal articles, book chapters, and conference papers examining institutional responses to changes in higher education policy. In partnership with the Education Commission for the States, she is currently principal investigator of the Getting Past Go Project at UMass Boston. This national research project, funded by the Lumina Foundation for Education, seeks to leverage developmental education as a critical component of state efforts to increase college attainment rates. Prior to joining the faculty at the University of Massachusetts Boston, Parker was a research assistant for the Alliance for International Higher Education Policy Studies (AIHEPS), directed by Richard C. Richardson at New York University. The AIHEPS project, funded by the Ford Foundation, examined the impact of state and provincial policy on higher education performance (i.e., degree completion and college choice). Dr. Parker earned her PhD from the Steinhardt School of Education at New York University.

APPLICATIONS OF A FLIPPED CLASSROOM MODEL: USING XYZ ETEXTBOOK, CO-TEACHING AND BLACKBOARD - ROOM M138
Matthew Meangru (Pace University), Yu Gu (Ph.D. candidate in Mathematics Education Teachers College, Columbia University), and Valeriya Demydovych (Pace University)

The application of a flipped classroom model can have a positive effect in an algebra classroom. Effective use of the XYZ eTextbook, co-teaching, and Blackboard enables professors to assign students videos that help them review sample problems. After students solve problems, they are given the opportunity to explain to the entire class. This co-teaching technique helps motivates students to learn mathematics and build their mathematical diction. Uploading images of their homework on Blackboard allows students to save money on purchasing homework platforms, and professors can see all the steps students followed which allows professors to see where students encounter difficulties.

ENHANCED COLLEGE ALGEBRA COURSE - ROOM M136
Tatyana Khodorovskiy (Hunter College)

Many students at Hunter College are not well prepared for the lowest credit-bearing course in college algebra, “Algebra for College Students” (4 hour/3 credit). In Fall 2016, Hunter began offering an “Enhanced Algebra for College Students” course, a 6 hour/3 credit course. The enhanced version of the algebra course covers the material from the regular algebra class at a slower pace. Students who were placed (via Accuplacer) into the enhanced version have a much higher pass rate than those who opt to take the 4 hour version. The same final is given in both courses.

MAINSTREAMING ALGEBRA STUDENTS TO ACCELERATE PROGRESSION ROOM M137
Karan Puri, Danielle Cifone (both from Queensborough Community College)

At Queensborough Community College, students who meet certain criteria are placed into the Accelerated Learning Program (ALP). These students would otherwise be deemed “developmental” and be required to take one semester of non-credit Elementary Algebra, before being eligible for enrollment into credit bearing College Algebra. ALP students are mainstreamed into College
program’s math classes successful, including a curriculum and pedagogy that emphasize student-centered instruction and conceptual understanding. We’ll discuss our underlying teaching values, and look at a sample lesson that puts those values into practice.

**CRACKING THE REMEDIAL MATH NUT - ROOM M138**

**Joseph Fera and Pamela Hinden (both from Lehman College)**

A significant number of Lehman College students cannot enroll in a credit mathematics course because they are unable to pass the CUNY math entrance exam. These students have no chance of completing their CUNY mathematics and quantitative reasoning graduation requirements within their first year of study, a great detriment to their path to graduation. In this talk, we will detail an in-progress pilot of an instructional model to support student success in a college-appropriate, contextualized mathematics course in their first semester at Lehman. The model presented is cost-effective and a sound curriculum alternative for non-STEM majors.

2:05-2:35 **Concurrent Sessions**

**CREATIVE APPROACH IN TEACHING HIGHLY MOTIVATED AND SUCCESS-ORIENTED ENGINEERING STUDENTS - ROOM M136**

**Malgorzata Marciniak (LaGuardia Community College)**

Engineering majors require a very particular methodology and approach in mathematics courses that prepare them for future work. Studies show that engineers spend 55% of their time either reading or writing, so these skills should be included in the curriculum. The work of an engineer is also problem-solving and project-oriented, often containing interdisciplinary aspects. We propose an activities-oriented classroom environment based on group work, collaboration, presentation and constructive feedback. The class contains elements of creative work and focuses on providing a basis for the development of creative thought and discovery in opposition to procedure and lecture-oriented teaching and learning.

**USING IMPROVEMENT SCIENCE TO ENHANCE OUT-OF-CLASS ENGAGEMENT IN STATWAY - ROOM M137**

**Milena Cuellar and Steven Cosares (both from LaGuardia Community College)**

We will discuss the application of Improvement Science to enhance out-of-class activities, such as homework, participation rates, and use of the Learning Management System. We describe our process for developing a set of evidence-based teaching practices or “interventions” to foster student engagement. Attendees will learn about the methodology used to identify and assess

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**Distinguished Panelists**

**Dr Andrew Hacker** is a political scientist and public intellectual. He is currently Professor Emeritus in the Political Science Department at Queens College, CUNY. He did his undergraduate work at Amherst College; this was followed by graduate work at Oxford University, the University of Michigan and Princeton University where he received his PhD degree. Hacker taught at Cornell before taking his current position at Queens. His book *Higher Education?* was written in collaboration with his wife Claudia Dreifus, a New York Times science writer and Columbia University professor. Dr. Hacker is a frequent contributor to the New York Review of Books. In his articles he has questioned whether mathematics learning is necessary, claiming that “Making mathematics mandatory prevents us from discovering and developing young talent.” More recently, he published a book titled *The Math Myth: And Other STEM Delusions*. In it he expands the scrutiny of many widely held assumptions about the purpose of mathematics and its effect on our mind, as well as the purpose of STEM majors. He also proposes alternatives, including teaching facility with figures, quantitative reasoning, and understanding statistics.

**Dr. Edward Rubio** is a Senior Policy Analyst in the Office of Policy Research at the City University of New York. His research focuses on measures of college readiness, placement tests, developmental education, and financial aid. Dr. Rubio was previously the Director of Research for the Office of English Language Learners at the New York City Department of Education, focusing primarily on student placement, outcomes, and program evaluation. Edward holds an M.A. and Ed.D. from the Harvard Graduate School of Education and obtained his B.A. from Brown University.
Thursday, March 22

2:30  Registration, Skylight Area near Little Theater, M Building
3:00  Opening Remarks
      Little Theater
Keynote Address by Dr. Michio Kaku: The Next 20 Years

Friday, March 23

8:30  Breakfast & Registration, Skylight Area near Little Theater, M Building
9:15  Welcome
      Little Theater
Keynote Address by Dr. Tara Parker: Rethinking Developmental Education for Racial Justice and Equity
10:40 Coffee Break, Skylight Area near Little Theater, M Building
10:55 Concurrent Sessions - see descriptions for locations
11:30 Concurrent Sessions
12:05 Concurrent Sessions
12:40 Lunch, Poolside Cafe
1:30 Concurrent Sessions
2:05 Concurrent Sessions
2:40 Concurrent Sessions
3:15 Coffee Break, Skylight Area, M Building
3:30 Fishbowl Conversation: Drs. Andrew Hacker and Edward Rubio
4:30 Celebration, Skylight Area, M Building

12:40 - 1:25 LUNCH  Poolside Cafe

1:30-2:00 Concurrent Sessions

Enabling STEM Students to Enroll Early in Calculus
Room M136
Lidia Gonzalez and Nawrin Fariha (both from York College)
York College has developed a sequence of workshops and courses that enable students to take calculus in their first full semester. The sequence consists of: (1) a college algebra workshop, which allows for enrolling in a college algebra class, but also leads to (2) an elementary trigonometry workshop, which allows for enrollment in a pre-calculus class, but also leads to (3) a booster pre-calculus class offered in summer or winter session, which leads to (4) a calculus class in the student’s first full semester. The curricula and workshop development process, descriptions of interactions with college administration, professional development, scheduling, recruitment, and outcomes assessment will be discussed.

CUNY Start: Helping Students Transition to College
Room M137
Gregory Fein, Hem Vyas and Kevin Winkler (all from CUNY Start)
Across CUNY, Black and Hispanic students are almost twice as likely to be placed into developmental education as White and Asian Students. Those students face reduced chances of completing degrees. CUNY Start is an intensive college transition program designed to help students with developmental needs meet proficiency standards in one semester, prepare for credit classes, persist, and graduate. In this session, we’ll examine data on CUNY Start’s success in enabling students to move closer to a college degree, and share some of what makes the
ONLINE OERS AT LAGUARDIA COMMUNITY COLLEGE - ROOM M136
Jeanne Funk, Alioune Khoule, Abderrazak Belkharraz, and Khalid Kassou (all from LaGuardia Community College)

Abstract: In Fall 2017, the Mathematics, Engineering, and Computer Science Department at LaGuardia Community College embarked on a year-long plan to explore and evaluate open online learning systems for use in basic skills and co-requisite model courses. In this presentation, we discuss the impetus for our year-long plan, its current status, the challenges we have identified along the way, and the economic impact for LaGuardia students. Discussion will include adaptation of existing courses for OER platforms, curation and evaluation of selected platforms, and plans for future expansion of the OER project in mathematics at LaGuardia.

CONTEXTUALIZATION OF COLLEGE ALGEBRA WITH ECONOMICS
ROOM M137
Glenn Henshaw, Tao Chen, Solomon Kone, and Choon Shan Lai (all from LaGuardia Community College)

SUMMIT-P is a joint project with ten institutions in eight states funded by the National Science Foundation (NSF). The goal of the project is to link mathematics curriculum with other STEM subjects/disciplines. The LaGuardia team, composed of mathematics and economics faculty, will contextualize College Algebra (MAT115) with economics topics. We will discuss the following facets of our project: connecting the college algebra curriculum with economics topics; designing algebra/economics projects; web-apps (exploratory tools)/exercises on MyOpenMath platform; assessment; and faculty training. We will also discuss the general timeline for our project and how we will interact with other institutions in SUMMIT-P.

THREE CUNY COMMUNITY COLLEGES EXPAND ACCELERATED LEARNING AND ALTERNATIVE PATHS IN QUANTITATIVE COURSES - ROOM M138
Johannes Familton (Borough of Manhattan Community College), Marla Sole (Guttman Community College), A J Stachelek (Hostos Community College)

Successful completion of developmental mathematics may be the single largest academic barrier to improving graduation rates in the United States. For this reason, three CUNY community colleges, BMCC, Guttman, and Hostos, launched PRIME (Project for Relevant and Improved Mathematics Education) in 2016. Funded by the Teagle Foundation, mathematics and science faculty have been assessing and revising their quantitative course sequences. Although the three colleges vary widely, they have the common goal of increasing student success. Presenters will discuss some of the curricular revisions implemented in the project along with baseline and outcome data. Successes and challenges experienced in the project will also be discussed.

USING HAWKS SOFTWARE TO IMPROVE STUDENT OUTCOMES ROOM M136
Inna Tokar (City College and Fashion Institute of Technology)

College educators working on improving student outcomes in mathematics face many challenges including increased class size and fewer fulltime faculty. Students struggle with balancing work and school as well as the high cost of textbooks. In 2016-2017, as a course supervisor for Math 15000 (Mathematics for the Contemporary World), I proposed using Hawks software for homework and testing. Use of this instructional software promotes improved outcomes through the following: decreased textbook and materials cost; electronic testing that allows individualized settings for students with disabilities; and the possibility of generating questions using randomized numerical data.

ALIGNING ELEMENTARY ALGEBRA WITH THE QUANTITATIVE NEEDS OF STUDENTS IN AN INTRODUCTORY NUTRITION COURSE - ROOM M137
Jonathan Cornick and Lana Zinger (both from Queensborough Community College)

In Spring 2015, faculty from English and Mathematics collaborated with Nutrition Science faculty to author an OER text, “The Mathematics of Nutrition Science” which addresses the “transfer of knowledge” problem by aligning nutrition examples and exercises with elementary algebra and quantitative reasoning principles, and including a few short writing assignments focused on having students reflect on mathematical problem solving in context. Topics include: reading food labels, graphing nutrition intake, and determining the content of a well-balanced diet. The experience of Allied Health faculty teaching and facilitating mathematical content, the process of aligning relevant topics, and the reflections of student participants will be discussed.

INTERVENTION IN REMEDIAL MATHEMATICS - ROOM M138
Alioune Khoule, Nana Osei Bonsu, Hassan El Houari, and Mangala Kothari (all from LaGuardia Community College)

Development and intervention have become big educational issues in developmental mathematics. However, the communities of mathematics educators and researchers have faced challenges in developing plans and research-based best practices for implementing intervention strategies in developmental mathematics. This project highlights adopted strategies to include diagnosing students’ problems throughout the semester to address this concern, and more importantly monitoring the progress of those struggling students. Some preliminary results will be shared.
TEACHING STRATEGIES BENEFITING REMEDIAL AND NON-REMEDIAL STUDENTS - ROOM M135
Salvatore Sommella (LaGuardia Community College)
The presenter will describe and discuss teaching strategies (turn and talk, jigsaw, etc.) which can benefit developmental and non-developmental students in a community college environment. It will be an interactive session.

VARIOUS USES OF TEST-GENERATOR SOFTWARE IN DEVELOPMENTAL MATHEMATICS COURSES - ROOM M136
Tanvir Prince (Hostos Community College)
I have been using “Test-Generator” software for more than seven years in elementary mathematics courses. This software is used to create: algorithmically-generated online homework assignments which can be automatically graded by Blackboard; online and paper quizzes; class handouts and workbooks; practice examples to help students prepare for the CEAFE; and multiple versions of the same exam. A workbook, complemented with some additional resources from Open Education Resources, can make the course a zero cost textbook course. In this presentation, I will demonstrate the installation and various uses of the software.

AN INTERDISCIPLINARY APPROACH TO TEACHING FINANCIAL LITERACY AND QUANTITATIVE REASONING SKILLS - ROOM M137
Marla Sole (Guttman Community College)
Despite the benefits of interdisciplinary thinking in school, subjects are often approached separately, leaving students to form bridges between disciplinary boundaries. However, knowledge may not easily transfer. If students are unable to recognize and apply concepts learned to new situations, the mathematical gains made may be of limited use. Because it is necessary and relates to equity, financial literacy is ideally suited for integration in courses requiring quantitative ability. Using an interdisciplinary approach, students strengthened their ability to estimate answers and to perform basic computations and their personal beliefs were challenged as they worked to understand complex problems from multiple perspectives.

Joint Session:
I. SUPPLEMENTAL INSTRUCTION AT LAguardia COMMUNITY COLLEGE

25 YEARS OF SERVICE TO LAguardia’S STUDENTS - ROOM M138
Reem Jaafar, Angela Cornelius, Andi Toce, Joyce Zaritsky, Anastacia Pal, and Joseph Evering (all from LaGuardia Community College)
Academic Peer Instruction (API) is a Supplemental Instruction/Peer Tutoring program at LaGuardia, celebrating its 25th anniversary this year. The program has supported over 14,000 students in “high risk” courses since its inception. API has been successful with participating students achieving on average one-half to one letter grade higher than non-participating students. In this presentation we will share how our model has evolved specifically for required mathematics courses, explain how our tutor training has changed to meet our students’ needs, and discuss the tools we use to assess the program so the maximum number of participants succeed.

II. THREE CUNY COMMUNITY COLLEGES DISCUSS SUPPLEMENTAL INSTRUCTION - ROOM M138
Johannes Familton (Borough of Manhattan Community College)
One specific suggestion for modifying developmental mathematics has been to place students assessed as needing the highest-level of these course into a college-level quantitative course with extra support. This procedure has been termed “supplemental instruction” (SI). Borough of Manhattan Community College faculty, along with other CUNY community college faculty, have been developing their own version of SI to accommodate these types of courses and their students. This more flexible form of SI was developed in order to remove the remedial stigma that is often attached to traditional academic assistance programs. Presenters will discuss the distinction between high-risk students and high-risk classes.

FACULTY AND STUDENT EXPERIENCES ACROSS REFORMED DEVELOPMENTAL COURSE MODELS IN THREE CUNY COMMUNITY COLLEGES

ROOM M135
Maggie Fay (PhD Candidate in Sociology, CUNY Graduate Center)
Colleges and university systems nationwide are implementing reforms in developmental math policy, course structure, curricular content, and pedagogy. However, little research has examined how faculty and students experience these redesigns or how such changes may impact student experiences and likelihood of completion in unintended ways. This qualitative study examines faculty and student experiences across three redesigned developmental math course models including a hybrid, co-requisite, and quantitative reasoning course. Findings suggest that the theory of action underlying course models is often inconsistent with stakeholders’ experiences in courses, and that unanticipated consequences of course redesigns can undermine the goals of reforms.