

Engaging Mathematics: Creating a National Community of Practice

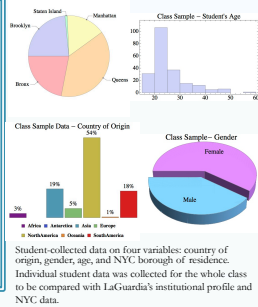
About the Initiative

Engaging Mathematics applies the well-established SENCER method to college-level mathematics courses, with the goal of using civic issues to make math more relevant to students.

Updates and resources developed throughout the initiative will be made available online to all interested educators, administrators, and students at www.engagingmathematics.net.

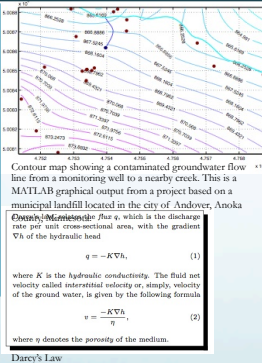
LaGuardia Community College

Drs. Mangala Kothari and Milena Cuellar are developing a statistics course "themed" with New York City called *NYC Statistics: A Tale of Two Cities*. All in-class and out-of-class activities are designed to include current NYC data related to urban issues, such as changes in city demographics, income and housing inequalities, NYPD practices, and the impacts and adaptation to climate change, among others.



Normandale Community College

Dr. Victor Padron is developing a module on groundwater pollution that is transferable to any standard-sequence calculus course, including pre-calculus or a mathematical modeling course. The aim of the module is to provide a self-contained introduction to the subject and to engage students in the process of using mathematical models to investigate real events of groundwater pollution.



Dr. Anthony Dunlop is developing new modules for a general education course for non-STEM students that teaches mathematics with data from a local watershed. The course involves raising questions about water quality or management, looking up available data, and introducing mathematical or statistical techniques that address the questions raised. Data for the course comes from official publications by the Nine Mile Creek Watershed.

Metropolitan State University

Dr. Rikki Wagstrom is developing four new modules for *Mathematics of Sustainability*, an intermediate algebra course she developed in 2010. The modules cover the topics of milkweed and monarch butterfly populations, wind energy, automotive fuel emissions, and the relationship between U.S. population growth and carbon dioxide. Each module will be a self-contained, portable unit suitable for use in college algebra, pre-calculus, and liberal arts mathematics courses. In addition, Dr. Wagstrom is creating a module suitable for a mathematical modeling or dynamical systems course with a focus on modeling the growth and sustainability of East Coast whelk populations.

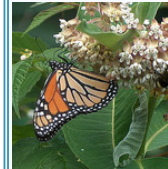
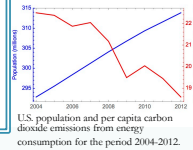


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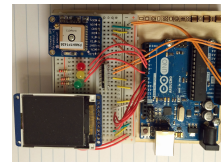


Minnesota Pollution Control Agency

Dr. Cindy Kaus is developing two new statistics courses: introductory level *Statistics I* and upper division *Environmental Statistics*. Students in both courses will complete semester-long research projects to analyze data obtained from stormwater collection by 29 different industrial sectors and 45 subsectors for use by the Minnesota Pollution Control Agency's Industrial Stormwater Division. *Statistics I* will first be taught in spring 2015, and *Environmental Statistics* in spring 2016.

United States Military Academy

Dr. Frank Wattenberg assists with developing and reviewing curricula, finding raw data sources, using technology, identifying best teaching practices, reviewing publications and teaching manuals, and customizing and developing assessments. USMA is currently exploring technology and public policy in the framework of robotics and embedded intelligence. Classes have begun using Arduino kits to motivate mathematics and to use the subject to solve pressing and often controversial problems.



An Arduino kit in use



Oglethorpe University

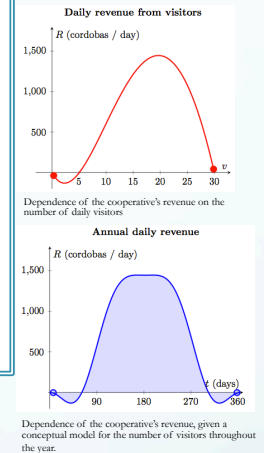
Drs. John Nardo and Lynn Gieger are developing two new modules on the mathematics of voting and the mathematics of poverty and income disparity for *Great Ideas of Modern Mathematics*, a general education course in Oglethorpe's core curriculum. The course delves deeply into math's more modern topics (topics developed since the time of Sir Isaac Newton), including probability, formal logic, sets and infinity, number theory, group theory, and knot theory.



Former President Carter at Oglethorpe University during Mentor Walk

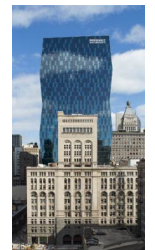
Augsburg College

Dr. John Zobitz is developing a projects-based calculus I course structured around hosting ecotourists at the Fair Trade Certified™ GARBO Coffee Cooperative in the Peñas Blancas region of Nicaragua. The course was inspired by an educational spring break trip to the Nicaraguan cooperative in 2012. One of the modules Dr. Zobitz is creating will evaluate additional revenue streams to offset any losses due to shortcomings in the annual coffee harvest. The module examines multi-faceted aspects of sustainability through analysis of resource allocation, revenue streams, and long-term sustainability for ecotourism development.



Roosevelt University

Dr. Barbara Gonzalez and Ms. Cathy Evins are developing *College Algebra: Modeling the City*, a new college algebra course that couples math concepts with the city of Chicago's social justice issues, including transportation, crime, water, food access, infrastructure, and demographics. The course will be "flipped" and will eventually be split into two versions: one for STEM majors and the other for business majors. Ultimately, educators based in other cities may use the resources created for Chicago as a model to create similar courses at their own institutions.



The Wabash Building at Roosevelt