# The Department of Earth, Environmental, and Geospatial Sciences at Lehman College
Master's of Science in Geographic Information Science (MS-GISc) Program

What is GISc?

Geographic Information Science (GISc) is a fast growing computer technology field involving mapping and analysis of spatial data. Geographic Information Systems (GIS) enable us to assess and manage existing conditions, and to predict future conditions, ranging from monitoring disease occurrences, to endangered species preservation, to managing water supplies, to tracking real estate values, to crime solving.
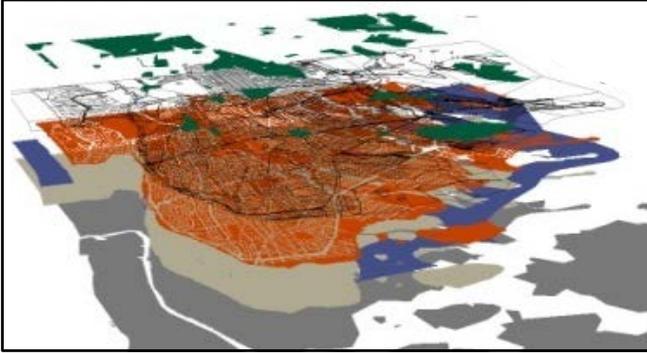
The Importance of GISc in Today's World

GISc is projected by the US Department of Labor to be one of the fastest-growing fields, and it is difficult to imagine a field that has not already been impacted by GISc. An understanding of GISc is vital for anyone using information that is geographically-based. This includes health services administrators, emergency management professionals, epidemiologists, ecologists, natural resource managers, law enforcers, environmental analysts, anthropologists, archaeologists, political scientists, sociologists, urban planners, hazard risk assessors, public administrators, geologists, economists, marketing professionals, and transportation planners.

GISc is used today in fields as diverse as criminal justice, marketing, economic development, public health administration, environmental analysis, ecology, urban planning, real estate, government, and education. GISc is an expanding field with excellent career opportunities, and GISc professionals are in high demand in many fields. People with GISc skills can also be more valuable as managers and analysts in their own fields. GISc has become instrumental in the decision-making process.


The MS-GISc Program at Lehman College

The Master's of Science degree in Geographic Information Science (MS-GISc) at Lehman College is the first program of its kind within the CUNY system. The MS-GISc is a 40-credit program with two tracks: the Professional Experience and Applied Research (PEAR) option, which seeks to prepare students for careers in GISc and the spatial sciences, and the Traditional Master's Degree option, which is appropriate for students intending to continue on to doctoral studies or assume positions in research institutes.

Students may concentrate in one of three areas: Environmental and Health Spatial Sciences; GISc Technology; or Urban Sustainability. All concentrations have a strong commitment to community and civic service, emphasizing full engagement with solving real-world problems, while promoting ethical uses of GISc technologies. Our objective is to create a learning environment that is socially conscious, environmentally aware, and focused on equity, while also developing and using the best, most innovative technical and methodological approaches.

The curriculum of the MS-GISc program is comprised of three key elements: 4 core courses (14 credits), 5-6 electives (18 credits), and an 8-credit capstone research experience, with options for either a traditional Master's Thesis, or a combination of an applied research project and professional experience through an internship (PEAR option –Professional Experience and Applied Research) for a total of 40 credits to complete the degree.
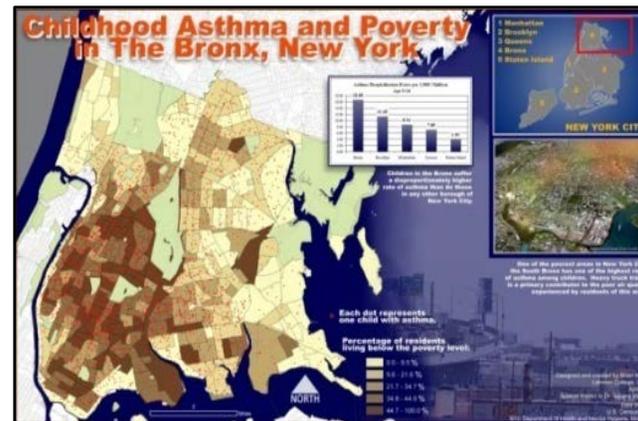
Lehman College has developed an Internship Program in GISc, allowing qualified students to earn credits while working in GISc positions, in preparation for careers in governmental agencies, the private sector consulting firms, not-for-profit organizations, and research institutes. Additionally, students have ample opportunities for field work experiences, both through structured coursework and organized trips-locally, regionally, and internationally.

Required Core Courses (14 credits):

Credits/Hours
GEP 505 Principles of GISc 3/4
GEP 621 Remote Sensing 4/6
GEP 630 Geostatistics and Spatial Analytical Concepts 3/4
GEP 605 Special Topics in GISc (Environmental Modeling) 4/6

Electives (18 credits) to be selected amongst the following:

Credits/Hours
GEP 602 Biogeography and GISc 4/5
GEP 606 Raster Analysis 3/4
GEP 610 Spatial Analysis of Urban Health (3/4)
GEP 620 Demography and Population Geography with GISc 3/4
GEP 631 Advanced Remote Sensing 4/6
GEP 632 Environmental Health and GISc 3/4
GEP 635 Natural Hazards and Risk Analysis 4/5
GEP 640 Urban Geography and GISc 3/4
GEP 641 Advanced Image Processing 4/6
GEP 650 Regional Geography & Applied Mapping Techniques 4/5
GEP 660 Geovisualization and Analytical Cartography 4/6
GEP 662 Introduction to Programming for GISc 3/4
GEP 664 Spatial Database Management 3/4
GEP 675 Data Integration and Data Acquisition Methods 3/4
GEP 680 Emerging Issues and Methods in GISc 3/4
GEP 689 Methods Seminar in GISc 3/4
GEP 691 Independent Study in GISc 2, 3, or 4 credits

Of the 18 elective credits required for the degree, up to 9 credits of courses may be taken in a cognate discipline, such as Public Health, Urban Planning, or Environmental Engineering, with permission of program advisor, and depending upon the student's career goals.

Capstone Experience Coursework (8 credits):

An 8-credit capstone experience, either the Thesis Option or the Professional Experience and Applied Research (PEAR) Option.
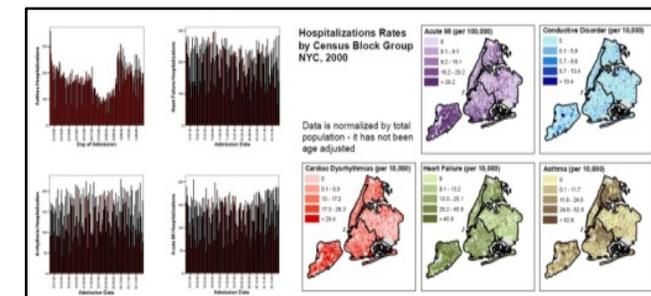
Traditional Master's Thesis Option:

GEP 695 Thesis Research in GISc 8 credits

PEAR Option:

GEP 690 Workshop in GISc Research 4/4 and
GEP 670 Internship in GISc/Professional Experience 4/4

MS-GISc Faculty

The MS-GISc faculty (listed below) consists of full-time professors who, in addition to having advanced degrees in the field and academic experience in teaching GISc, have also held GISc positions in various governmental agencies, not-for-profit organizations, and private sector consulting firms, outside of academia. The MS-GISc program faculty also includes several adjunct instructors who are drawn from the professional world of GISc practice, lending an additional "real-world" experiential aspect to the program.

Juliana Maantay, Ph.D., Professor and Director of MS-GISc Program
http://www.lehman.edu/academics/eggs/fac-maantay.php

Yuri Gorokhovich, Ph.D., Assistant Professor
http://www.lehman.edu/academics/eggs/fac-gorokhovich.php

Glen Johnson, Ph.D., Associate Professor
http://www.lehman.edu/academics/health-sciences/faculty.php#johnson

Elia Machado, Ph.D., Assistant Professor

Andrew Maroko, Ph.D., Assistant Professor
http://www.lehman.edu/academics/health-sciences/face-maroko.php

MS-GISc Program Advisory Board

The MS-GISc Program has an External Advisory Board with representation from the GISc industry, private sector consulting firms, not-for-profit organizations, academic research institutes, and local, state, and federal governmental agencies. The Board provides insights and guidance to the curriculum, the internship experience, and research directions.

MS-GISc Program Application Process:

Applications to the MS-GISc Program are accepted through the "Apply Yourself" on-line process, which can be accessed at
https://app.applyyourself.com/?id=lehmangrad

In order to be admitted to the MS-GISc graduate program, applicants are required to have earned a Bachelor's degree with minimum 3.0 GPA, and provide official transcripts of all post-secondary school coursework, at least 2 letters of recommendation, and a short essay describing their interest in GISc and the MS-GISc Program at Lehman.

The deadline for Fall term admissions is March 1st of the prior Spring term. The deadline for Spring term admissions is October 1st of the prior Fall term.

Questions about the admissions process should be directed towards the Graduate Admissions Office, at 718 960-8777
or Email: graduate.admissions@lehman.cuny.edu

For More Information about the MS-GISc Program, please contact:

Professor Juliana Maantay, MS-GISc Program Director
juliana.maantay@lehman.cuny.edu
Tel 718.960.8574

MS-GISc Program website:

http://www.lehman.edu/academics/eggs/MS_GISc.php

## GISc Laboratory, Teaching and Research Facilities

The GISc labs at Lehman College include a fully equipped teaching lab and separate research lab (the Urban GISc Lab), along with a full-time College Laboratory Technician to aid in maintenance of the facilities and to provide technical assistance to faculty and students.

Hardware includes twenty-five desktop Windows PCs, as well as various other desktop and laptop PCs. All computers are equipped with the full version of ESRI ArcGIS, including ArcMap, ArcCatalog, ArcGlobe, ArcScene, and ArcReader, and associated extensions. DIVA GIS, Quantum GIS, GeoDa, HDF Explorer, Trimble GPS Pathfinder, TerraSync, ColorPic, R statistical computing, IDRISI Selva software for Remote Sensing applications, Maxent, ScapeToad, and MS Office Suite are on all teaching computers. Selected machines are loaded with ENVI (remote sensing), AERMOD (air dispersion modeling), GWR3 (spatial statistics), SPSS and SAS (statistics), Aeroqual (aerosol analysis), AEROComm (particulate matter analysis), and NoiseTools (noise-level analysis).

Printing capability includes color laser printers as well as a large-format plotter and scanner. Our departmental server contains a wide range of data including ESRI Datasets, the Americas Basemap, orthophotos of the NYC region, Census/ACS data, and protected data used for specific projects and research studies.

Other hardware includes Optimus sound level meters, Aerocet particulate matter monitors, portable Trimble GPS devices, Ozone Solutions ozone monitors, Davis weather stations with temperature, humidity, wind, solar and UV radiation sensors, and purpose built "rugged" laptops for field work. The Urban GISc Lab contains four GISc workstations with dual monitors, with ESRI and other software installed. The facility is fully integrated into the GISc Lab network.

The Lehman GISc Program is a partner in the CUNY CREST Institute and a founding member of NOAA-CREST (National Oceanic and Atmospheric Administration's Cooperative Remote Sensing Science and Technology). NOAA-CREST faculty and students are involved in research projects pertaining to the NOAA sciences, and are active in publishing and presenting their work. See http://crest.ccny.cuny.edu/ for more information.
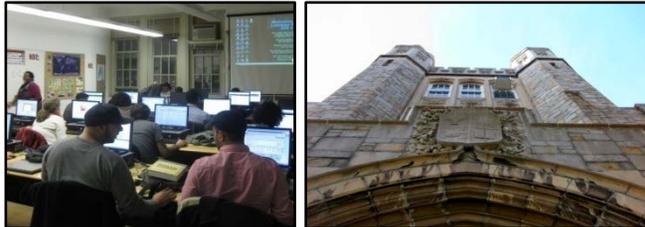
Lehman is an independent liberal arts college of The City University of New York offering nearly 100 undergraduate and graduate degree programs. Located on a historic tree-lined campus in the northwest Bronx, the College is a cultural and recreational center for the region, with its Center for the Performing Arts, Lehman College art Gallery, and The APEX, a major center for sports and health education. Lehman's campus is easily accessible by public transportation and major roads from Manhattan and other boroughs as well as Westchester and Rockland Counties.

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