LEHMAN COLLEGE
OF THE
CITY UNIVERSITY OF NEW YORK

DEPARTMENT OF EARTH, ENVIRONMENTAL AND GEOSPATIAL SCIENCES

CURRICULUM CHANGE

Name of Program and Degree Award: Earth Science, BA
Hegis Number: 1914.00
Program Code: 34028

1. **Type of Change:** Change in Degree Requirements

2. **From:** ~~Strikethrough~~ the changes

The Interdisciplinary Program in Earth Science, B.A. is a 38-credit major recommended for earth data users, analysts, programmers and developers.

The core of the interdisciplinary undergraduate program in Earth Science is a sequence of basic and advanced courses from EEGS and Computer Science and Math.

The Interdisciplinary Program in Earth Science offers courses to prepare students: (1) for the use and analysis of the earth (lithosphere, hydrosphere and atmosphere) data; (2) to meet the demands of local, state, and federal governmental agencies, private consulting, and industry in using earth data to solve societal problems, such as climate change, impact of natural hazards, agriculture, water supply and many others; (3) to pursue advanced degrees in earth data science and information technology.

Major Requirements – Overall
Type: Completion requirement
Earn at least 38 credits

Major Requirements – Required Courses
26 Credits
Fulfill ALL of the following requirements:
Complete ALL of the following Courses:

GEO 170 Earth Science and Society	(3 credits)
GEO 280 Earth Observation Information (PREREQ: GEO 170)	(3 credits)
GEO 360 Earth Data Models and Analysis (PREREQ: GEO 170)	(3 credits)
GEP 204 Basic Mapping: Applications and Analysis	(3 credits)
GEP 321 Introduction to Remote Sensing (PREREQ: GEP 204)	(4 credits)
MAT 128 Foundations of Data Science	(3 credits)

MAT 328 Techniques in Data Science (4 credits)
(PREREQ: MAT 128)
SOC 348 - Reasoning with Data (3 credits)
(PREREQ: MAT 128)

AND
At least 3 credits must be 300-level or above to be chosen from the following:

Earn at least 12 credits from the following:
GEO 101 Dynamic Earth (3 credits)
GEO 102 Dynamic Earth (1 credit)
GEO 228 Weather and Climate (3 credits)
GEO 229 Weather and Climate (1 credits)
GEO 340 Natural Hazards and Disasters (3 credits)
GEO 341 Natural Hazards and Disasters (1 credit)
GEO 345 Environmental Hydrology (4 credits)
GEO 490 Honors Geology (4 credits)
GEO 3750 Data Acquisition and Integration Methods for GIS Analysis (3 credits)
(PREREQ: GEP 204)
GEP 205 Principles of Geographic Information Science (3 credits)
GEP 330 Spatial Statistics and Advanced Quantitative Methods in Geography (3 credits)
(PREREQ: GEP 204 or GEP 205)
GEP 350 Special Projects in Geographic Information Systems (4 credits)
(PREREQ: GEP 205)
CMP 128 Programming through Web Development (3 credits)
CMP 167 Programming Methods I (3 credits)
(Corequisite: CMP157)
AND CMP 157 Programming Methods I Lab (1 credit)
CMP 158 Programming Methods II Lab (1 credit)
CMP 168 Programming Methods II (4 credits)
(Corequisite: CMP 158)
AND CMP 158 Programming Methods II Lab. (1 credit)
CMP 338 Data Structures and Algorithms I (4 credits)
(PREREQ: CMP 232 and CMP 326 or CMP 168)
CMP 415 Machine Learning (4 credits)
(PREREQ: CMP 158, CMP 168, MAT 313)
CMP 414 Artificial Intelligence (4 credits)
(PREREQ: CMP 338)
CMP 343 Full Stack Web Development (4 credits)
(PREREQ: CMP 158, CMP 168)
CIS 333 Cybersecurity for Networked Systems CIS (4 credits)

3. **To:** Underline the changes

The Interdisciplinary Program in Earth Science, B.A. is a 38-credit major recommended for earth data users, analysts, programmers and developers.

The core of the interdisciplinary undergraduate program in Earth Science is a sequence of basic and advanced courses from EEGS and Computer Science and Math.

The Interdisciplinary Program in Earth Science offers courses to prepare students: (1) for the use and analysis of the earth (lithosphere, hydrosphere and atmosphere) data; (2) to meet the demands of local, state, and federal governmental agencies, private consulting, and industry in using earth data to solve societal problems, such as climate change, impact of natural hazards, agriculture, water supply and many others; (3) to pursue advanced degrees in earth data science and information technology.

Major Requirements – Overall
Type: Completion requirement
Earn at least 38 credits

Major Requirements – Required Courses
26 Credits in required courses
Fulfill ALL of the following requirements:
Complete ALL of the following Courses:

GEO 170 Earth Science and Society	(3 credits)
GEO 280 Earth Observation Information (PREREQ: GEO 170)	(3 credits)
GEO 360 Earth Data Models and Analysis (PREREQ: GEO 170)	(3 credits)
GEP 204 Basic Mapping: Applications and Analysis	(3 credits)
GEP321 Introduction to Remote Sensing (PREREQ: GEP 204)	(4 credits)
MAT 128 Foundations of Data Science (Python)	(3 credits)
MAT 328 Techniques in Data Science (Python) (PREREQ: MAT 128)	(4 credits)
SOC 348 - Reasoning with Data (R) (PREREQ: MAT 128)	(3 credits)

AND
At least 3 credits must be 300-level or above to be chosen from the following:

Earn at least 12 credits from the following:

GEO 101 Dynamic Earth	(3 credits)
GEO 102 Dynamic Earth	(1 credit)
GEO 228 Weather and Climate	(3 credits)
GEO 229 Weather and Climate	(1 credits)
GEO 340 Natural Hazards and Disasters	(3 credits)
GEO 341 Natural Hazards and Disasters	(1 credit)
GEO 345 Environmental Hydrology	(4 credits)

GEO 490 Honors Geology	(4 credits)
GEO 3750 Data Acquisition and Integration Methods for GIS Analysis (PREREQ: GEP 204)	(3 credits)
GEP 205 Principles of Geographic Information Science	(3 credits)
GEP 330 Spatial Statistics and Advanced Quantitative Methods in Geography (PREREQ: GEP 204 or GEP 205)	(3 credits)
GEP 350 Special Projects in Geographic Information Systems (PREREQ: GEP 205)	(4 credits)
GEP 362 Introduction to Programming for GISc	(3 credits)
CMP 128 Programming through Web Development	(3 credits)
CMP 167 Programming Methods I (Corequisite: CMP 157)	(3 credits)
AND CMP 157 Programming Methods I Lab	(1 credit)
CMP 158 Programming Methods II Lab	(1 credit)
CMP 168 Programming Methods II (Corequisite: CMP 158)	(4 credits)
AND CMP 158 Programming Methods II Lab.	(1 credit)
CMP 338 Data Structures and Algorithms I (PREREQ: CMP 232 and CMP 326 or CMP 168)	(4 credits)
CMP 415 Machine Learning (PREREQ: CMP 158, CMP 168, MAT 313)	(4 credits)
CMP 414 Artificial Intelligence (PREREQ: CMP 338)	(4 credits)
CMP 343 Full Stack Web Development (PREREQ: CMP 158, CMP 168)	(4 credits)
CIS 333 Cybersecurity for Networked Systems CIS	(4 credits)

4. **Rationale (Explain how this change will impact learning outcomes of the department and Major/Program):**
Including GEP 362 Introduction to Programming for GISc as an elective course in the Earth Science, BA program will help students broaden their choice of elective courses. The program does not have a programing course focusing on geospatial applications and methods.

5. **Date of departmental approval:** September 24, 2026

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CURRICULUM CHANGE

1. **Type of change:** *New Course*

2.

Department(s)	Earth, Environmental, and Geospatial Sciences
Career	[X] Undergraduate [ ] Graduate
Academic Level	[X] Regular [ ] Compensatory [ ] Developmental [ ] Remedial
Subject Area	ENV, GEP, GEO
Course Prefix & Number	GEP 215, GEO 215, ENV 215
Course Title	Introduction to Geospatial Artificial Intelligence (GeoAI)
Description	Introduction to Geospatial Artificial Intelligence (GeoAI), including machine learning with a focus on basic applications of AI to geospatial data in research and real-world problems.
Pre/ Co Requisites	GEP 204, 205 OR Departmental Permission
Credits	3
Hours	4 (2 Lecture, 2 Lab)
Liberal Arts	[ ] Yes [X] No
Course Attribute (e.g. Writing Intensive, WAC, etc)	
General Education Component	__X_ Not Applicable ____ Required ____ English Composition ____ Mathematics ____ Science ____ Flexible ____ World Cultures ____ US Experience in its Diversity ____ Creative Expression ____ Individual and Society ____ Scientific World

3. **Rationale:**
Geospatial artificial intelligence (GeoAI) is a rapidly emerging area of innovation and workforce demand adjacent to Geographic Information Science (GISc) with a broad range of applications in Environmental Science, Earth Science, and Geography. As geospatial data from satellites, sensors, and mobile devices grow rapidly, AI and machine learning offer powerful tools for analyzing these large, complex datasets. There is a growing need for professionals who can bridge GISc skills with foundational data science and AI skills. This introductory course addresses this need in EEGS' programs' offerings.

4. **Learning Outcomes (By the end of the course students will be expected to):**
1. Demonstrate ability to communicate effectively basic concepts and methods in Geospatial Artificial Intelligence (GeoAI).
2. Write scripts to process, analyze, and visualize geospatial data using GeoAI libraries.
3. Apply basic GeoAI methods to address research questions and real-world applications.
4. Evaluate the performance of GeoAI methods.
5. Visualize data and analysis results using GeoAI.
6. Develop reproducible GeoAI workflows through clear documentation and well-structured code.
7. Demonstrate ability to communicate effectively the ethical implications of GeoAI applications, including bias, privacy, and environmental impact.

5. **Date of Departmental Approval:** September 24, 2026