

**LEHMAN COLLEGE
OF THE
CITY UNIVERSITY OF NEW YORK**

DEPARTMENT OF CHEMISTRY

CURRICULUM CHANGE

1. **Type of Change:** *Pre/Co Requisites*

2. **From:**

Department(s)	Chemistry
Career	<input checked="" type="checkbox"/> Undergraduate [] Graduate
Academic Level	<input checked="" type="checkbox"/> Regular [] Compensatory [] Developmental [] Remedial
Subject Area	Chemistry
Course Prefix & Number	CHE 344
Course Title	Physical Chemistry Course in Kinetics and Thermodynamics
Description	Selected topics drawn from thermodynamics, states of matter, statistical thermodynamics and kinetics with an emphasis on the relation between experiment and theory.
Pre/ Co Requisites	PREREQ: CHE 168, PHY 169, and MAT 176
Credits	3
Hours	3
Liberal Arts	<input checked="" type="checkbox"/> Yes [] No
Course Attribute (e.g. Writing Intensive, WAC, etc)	
General Education Component	<input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Required <input type="checkbox"/> English Composition <input type="checkbox"/> Mathematics <input type="checkbox"/> Science <input type="checkbox"/> Flexible <input type="checkbox"/> World Cultures <input type="checkbox"/> US Experience in its Diversity <input type="checkbox"/> Creative Expression <input type="checkbox"/> Individual and Society <input type="checkbox"/> Scientific World <input type="checkbox"/>

3. To:

Department(s)	Chemistry
Career	<input checked="" type="checkbox"/> Undergraduate [] Graduate
Academic Level	<input checked="" type="checkbox"/> Regular [] Compensatory [] Developmental [] Remedial
Subject Area	Chemistry
Course Prefix & Number	CHE 344
Course Title	Physical Chemistry Course in Kinetics and Thermodynamics
Description	Selected topics drawn from thermodynamics, states of matter, statistical thermodynamics and kinetics with an emphasis on the relation between experiment and theory.
Pre/ Co Requisites	PREREQ: CHE 168, <u>PHY 167</u> or PHY 169, and MAT 176
Credits	3
Hours	3
Liberal Arts	<input checked="" type="checkbox"/> Yes [] No
Course Attribute (e.g. Writing Intensive, WAC, etc)	
General Education Component	<input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Required <input type="checkbox"/> English Composition <input type="checkbox"/> Mathematics <input type="checkbox"/> Science <input type="checkbox"/> Flexible <input type="checkbox"/> World Cultures <input type="checkbox"/> US Experience in its Diversity <input type="checkbox"/> Creative Expression <input type="checkbox"/> Individual and Society <input type="checkbox"/> Scientific World

4. Rationale (Explain how this change will impact the learning outcomes of the department and Major/Program):

Based on a department assessment of the success of students in CHE344 over the last 3 years we have come to recognize that Physics II for Scientists and Engineers (PHY169) is not necessary for success in this course. While students do need a basic understand of physics concepts, they do not need the calculus that is presented as part of this course. The required

pre-requisite knowledge can be attained from General Physics II (PHY167). As a result, we are including PHY 167 as an acceptable physics prerequisite for this course.

5. **Date of departmental approval:** March 14, 2025

**LEHMAN COLLEGE
OF THE
CITY UNIVERSITY OF NEW YORK**

DEPARTMENT OF CHEMISTRY

CURRICULUM CHANGE

Name of Program: Chemistry, BA
Hegis Code: 1905.00
Program Code: 34241 – CHEM-BA

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

2. **From**:

Chemistry, B.A. (54-67 Credit Major)

The Chemistry BA is comprised of a core of 32-42 credits and an area of concentration in chemistry or biochemistry. This major is recommended for those students in chemistry who are preparing for (1) admission to medical, veterinary, or dental school; (2) certification as secondary school teachers of chemistry; or (3) positions in the chemical industry.

Major Requirements – Core Courses

Chemistry (32-42 credits)

Chemistry (18-24 credits).

Complete at least one of the following courses:

CHE 166

and CHE 167

Or

CHE 114

and CHE 115

CHE 114, CHE 115 only with departmental permission.

Complete all of the following courses:

CHE 168

CHE 169

CHE 232

CHE 233

CHE 234

CHE 235

CHE 450

CHE 450 may be repeated for a total of 4 credits

Mathematics and Physics (14-18 credits).

Complete all of the following courses:

MAT 175

MAT 176

Complete at least one of the following courses:

PHY 166

and PHY 167

Or

PHY 168

and PHY 169

Chemistry Concentration

Chemistry: Fulfill ALL of the following requirements: (18-20 credits)

Earn at least 15 credits from the following:

CHE 249

CHE 342

CHE 344

CHE 345

CHE 347

Earn at least 3 credits:

One 3-5 credit elective CHE course at the 200 level or above, excluding CHE 391 and CHE 491.

Mathematics (4 credits).

Earn at least 4 credits from the following:

MAT 226

Biochemistry Concentration

Chemistry: Fulfill ALL of the following requirements: (16-18 credits)

Earn at least 13 credits from the following:

CHE 342

Or CHE 344

CHE 444

CHE 446

CHE 447

Earn at least 3 credits:

One Chemistry course at the 200 level or above excluding CHE 391 and CHE 491.

Biology (8 credits).

Earn at least 8 credits from the following:

BIO 166

BIO 167

3. To:

Chemistry, B.A. (54-70 Credit Major)

The Chemistry BA is comprised of a core of 32-42 credits and an area of concentration in Chemistry, or Biochemistry, Data Science or Environmental Chemistry. This major is recommended for those students in chemistry who are preparing for (1) admission to medical, veterinary, or dental school; (2) certification as secondary school teachers of chemistry; or (3) positions in the chemical industry and related fields.

Chemistry Core (required) (32-42 credits)

Chemistry (18-24 credits).

Complete at least one of the following courses:

CHE 166

and CHE 167

Or

CHE 114

and CHE 115

CHE 114, CHE 115 only with departmental permission.

Complete all of the following courses:

CHE 168

CHE 169

CHE 232

CHE 233

CHE 234

CHE 235

CHE 450

CHE 450 may be repeated for a total of 4 credits

Mathematics and Physics (14-18 credits).

Complete all of the following courses:

MAT 175

MAT 176

Complete at least one of the following courses:

PHY 166

and PHY 167

Or

PHY 168

and PHY 169

Chemistry Concentration (22-24 credits)

Chemistry: Fulfill ALL of the following requirements: (18-20 credits)

Earn at least 15 credits from the following:

CHE 249

CHE 342

CHE 344

CHE 345

CHE 347

Earn at least 3 credits:

One 3-5 credit elective CHE course at the 200 level or above, excluding CHE 391 and CHE 491.

Mathematics (4 credits).

Earn at least 4 credits from the following:

MAT 226

Biochemistry Concentration (24-26 credits)

Chemistry: Fulfill ALL of the following requirements: (16-18 credits)

Earn at least 13 credits from the following:

CHE 342

Or CHE 344

CHE 444

CHE 446

CHE 447

Earn at least 3 credits:

One Chemistry course at the 200 level or above excluding CHE 391 and CHE 491.

Biology (8 credits).

Earn at least 8 credits from the following:

BIO 166

BIO 167

Data Science Concentration (28 credits)

Chemistry: Fulfill ALL of the following requirements: (15 credits)

Earn 15 credits from the following:

CHE 249

CHE 342

CHE 344

CHE 362

Mathematics (8 credits)

Earn at least 8 credits from the following:

MAT 128 Or MAT 301 and MAT 313

Computer Science (4 credits)

CMP 157

CMP 167

Environmental Chemistry Concentration (26-28 credits)

Chemistry: Fulfill ALL of the following requirements: (16-18 credits)

Earn at least 13 credits from the following:

CHE 249

CHE 449 and CHE 362

Or CHE 464

Earn at least 3 credits:

One 3-5 credit elective CHE course at the 200 level or above excluding CHE 391 and CHE 491.

Mathematics (4 credits).

Earn at least 4 credits from the following:

MAT 128 or MAT 301

Environmental Science (6 credits).

Earn at least 6 credits from the following:

ENV 210

ENV 270

ENV 235 or ENV 326

4. Rationale (Explain how this change will impact learning outcomes of the department and Major/Program):

Chemistry is adding two new chemistry tracks to the BA degree, Data Science and Environmental Chemistry. This change comes in response to the need for a more diversified workforce in Chemistry. The current job market includes more positions for students trained in programming and data science as well as those trained in connecting chemistry to the environment. We are responding to this expansion to ensure our graduates are trained to go either into graduate school or directly into the workforce.

5. **Date of departmental approval:** October 29, 2025

**LEHMAN COLLEGE
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SCHOOL OF NATURAL AND SOCIAL SCIENCES

CURRICULUM CHANGE

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

2.

Department(s)	School of Natural and Social Sciences (NSS)
Career	<input checked="" type="checkbox"/> Undergraduate [] Graduate
Academic Level	<input checked="" type="checkbox"/> Regular [] Compensatory [] Developmental [] Remedial
Subject Area	Data Science in Chemistry
Course Prefix & Number	CHE 362
Course Title	Data Science in Chemistry
Description	Fundamentals of machine learning and its applications in chemistry, biochemistry, and materials science. Combined lectures and hands-on exercises that introduce real-world datasets and practical coding in python and will also incorporate AI tools to support learning and scientific problem-solving.
Pre/ Co Requisites	Departmental Permission
Credits	4
Hours	5
Liberal Arts	[] Yes <input checked="" type="checkbox"/> No
Course Attribute (e.g. Writing Intensive, WAC, etc)	
General Education Component	<input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Required <input type="checkbox"/> English Composition <input type="checkbox"/> Mathematics <input type="checkbox"/> Science <input type="checkbox"/> Flexible <input type="checkbox"/> World Cultures <input type="checkbox"/> US Experience in its Diversity <input type="checkbox"/> Creative Expression <input type="checkbox"/> Individual and Society <input type="checkbox"/> Scientific World

3. **Rationale:**

The current job market includes more positions for students trained in programming and data science. We are responding to this expansion to ensure that our undergraduate students are trained to go wither into graduate school or directly into the workforce.

Chemical research and industry jobs in the 21st century are now more than ever requiring data-driven decision making. The advent of AI and increased use of computational modeling, coupled with the availability of high-throughput experimental methods, has led to the generation of massive, complex datasets that now need to be analyzed. Chemistry students need both to understand how these data sets were generated and how to effectively interpret them to extract meaningful insights. In response to this need, Chemistry is creating a new course in Data Science that will be the foundation of a new Data Science track within the major. We have determined that chemistry graduates who want to succeed in this new data-driven and technologically advanced age must possess a strong foundation in data science principles.

A dedicated Data Science course will modernize the chemistry curriculum, ensuring that students are equipped not only with experimental expertise but also with the analytical and computational skills necessary for 21st-century scientific practice.

The broader goals of the course will be to expose undergraduate students to complex data sets that they learn to analyze using statistical and computational tools (such as Python, R, and relevant chemistry-focused software) and to enhance their quantitative and computational literacy. Students will be introduced to data science techniques, including machine learning, pattern recognition, and multivariate analysis, and learn how these methods can be applied to address real-world problems in chemistry, biochemistry, and materials science.

It is our hope that this course and the new Data Science concentration will help prepare our Chemistry graduates for the new and merging careers.

4. **Learning Outcomes (By the end of the course students will be expected to):**

- Process and analyze chemical and biological datasets
- Build supervised and unsupervised ML models
- Evaluate model performance and avoid overfitting
- Apply neural networks to scientific problems
- Use AI tools to enhance coding skills and learning performance
- Data visualization for effective scientific communication

5. **Date of Approval by Chemistry Department:** October 29, 2025