LEHMAN COLLEGE
OF THE
CITY UNIVERSITY OF NEW YORK

DEPARTMENT OF_BIOLOGICAL SCIENCES

CURRICULUM CHANGE

Name of Program and Degree Award: Biological Sciences, Bachelor of Arts
Hegis Number: 0401.00
Program Code: 34022
Effective Term: Fall 2017

1. **Type of Change:** Change in Degree Requirements, Name of Registered Degree

2. **From:**
Biology I, B.~~A.~~ (~~69-70~~ Credit Major)

The required courses and credits are distributed as follows:
Credits (~~69-70~~)

~~8~~ credits in:		Credits
BIO 166	Principles of Biology: Cells and Genes	4
BIO 167	Principles of Biology: Organisms	4

BIO 166, BIO 167: One counts as General Education and the other toward the major. Both are prerequisites to all other Biology courses.

~~24 credits in advanced Biology courses: Credits~~
~~BIO 200, 300, and 400 levels Biology courses~~

~~200, 300 and 400 levels Biology courses: With at least 12 credits at the 300 level or higher. Course schedules to be approved by the Department's student adviser.~~

~~10~~ credits in general chemistry:		Credits
CHE 166	General Chemistry I	~~3~~
CHE 167	General Chemistry Laboratory I	~~2~~
CHE 168	General Chemistry II	~~3~~
CHE 169	General Chemistry Laboratory II	~~2~~

10 credits in organic chemistry		Credits
CHE 232	Organic Chemistry Lecture I	3
CHE 233	Organic Chemistry Laboratory I	2
CHE 234	Organic Chemistry Lecture II	3
CHE 235	Organic Chemistry Laboratory II	2

10 credits in general physics:		Credits
PHY 166	General Physics I	5
PHY 167	General Physics II	5

~~7-8~~ credits in mathematics:		Credits
MAT 175	Calculus I	4
	~~And~~	
~~MAT 176~~	~~Calculus II~~	~~4~~
	~~Or~~	
~~MAT 175~~	~~Calculus I~~	~~4~~
	~~And~~	
~~MAT 231~~	~~Statistics for Biologists~~	~~4~~
	~~Or~~	
~~BIO 240~~	~~Biostatistics~~	~~3~~
	~~Or~~	
~~PSY 226~~	~~Statistical Methods in Psychology~~	~~4~~

~~Qualified students may also take:~~		~~Credits~~
~~BIO 450~~	~~Biology Seminar~~	~~1~~
~~BIO 489~~	~~Introduction to Experimental Biology~~	~~1~~
~~BIO 490~~	~~Honors in Biological Sciences~~	~~3~~

3. **To:**
Biology I, B.S. (70-74 Credit Major)

The required courses and credits are distributed as follows:
Credits (70-74)

15 credits in Foundation (Required) Courses:		Credits
BIO 166	Principles of Biology: Cells and Genes	4
BIO 167	Principles of Biology: Organisms	4
BIO 238	Genetics	4
BIO 240	Biostatistics	3

BIO 166, BIO 167: One counts as General Education and the other toward the major. Both are prerequisites to all other Biology courses.

11 credits in general chemistry:		Credits
CHE 166	General Chemistry I	4
CHE 167	General Chemistry Laboratory I	1.5
CHE 168	General Chemistry II	4
CHE 169	General Chemistry Laboratory II	1.5

10 credits in organic chemistry		Credits
CHE 232	Organic Chemistry Lecture I	3
CHE 233	Organic Chemistry Laboratory I	2
CHE 234	Organic Chemistry Lecture II	3
CHE 235	Organic Chemistry Laboratory II	2

10 credits in general physics:		Credits
PHY 166	General Physics I	5
PHY 167	General Physics II	5

4 credits in mathematics:		Credits
MAT 175	Calculus I	4

21-24 credits in one of the following tracks: Credits

Biomedical Sciences 21-23
Select courses from Lists: A, B, and C

12 credits from List A

BIO 228	Mammalian Physiology	4
BIO 267	Comparative Anatomy of Vertebrates	4
BIO 331	Experimental Microbiology	4
BIO 333	Endocrine Physiology	4
BIO 350	Introduction to Immunology	4
BIO 400	Biological Chemistry	4
BIO 415	Medical Microbiology	4
BIO 420	Molecular Biology	4

At least 8 credits from List B

BIO 241	Evolution Species and Biogeography	3
BIO 268	Vertebrate Embryology	4
BIO 311	Parasitology	3
BIO 312	Parasitology Laboratory	2
BIO 320	Neural Development: From Genes and Cells to Brains	3
BIO 321	Neural Development Laboratory	2
BIO 330	Plant Physiology	4
BIO 336	Marine Biology	3
BIO 338	Genetics of Man	4
BIO 339	Ecology	4
BIO 340	Human Body and Brain	3
BIO 341	Human Body and Brain Laboratory	2
BIO 401	Biological Systematics	4
BIO 406	Biochemistry of Differentiation	4
BIO 431	Comparative Animal Physiology	4
BIO 435	Neurophysiology	3
BIO 465	Microbial Physiology and Genetics	4

At least 1 credit from List C:

BIO 450	Biology Seminar	1
BIO 489	Introduction to Experimental Biology	1
BIO 490	Honors in Biological Sciences	3

Organismic Sciences 21-23

Select courses from Lists: A, B, and C

At least 12 credits from List A

BIO 241	Evolution Species and Biogeography	3
BIO 268	Vertebrate Embryology	4
BIO 311	Parasitology	3
BIO 312	Parasitology Laboratory	2
BIO 320	Neural Development: From Genes and Cells to Brains	3
BIO 321	Neural Development Laboratory	2
BIO 330	Plant Physiology	4
BIO 336	Marine Biology	3
BIO 338	Genetics of Man	4
BIO 339	Ecology	4
BIO 340	Human Body and Brain	3
BIO 341	Human Body and Brain Laboratory	2
BIO 401	Biological Systematics	4
BIO 406	Biochemistry of Differentiation	4
BIO 431	Comparative Animal Physiology	4
BIO 435	Neurophysiology	3
BIO 465	Microbial Physiology and Genetics	4

8 credits from List B

BIO 228	Mammalian Physiology	4
BIO 267	Comparative Anatomy of Vertebrates	4
BIO 331	Experimental Microbiology	4
BIO 333	Endocrine Physiology	4
BIO 350	Introduction to Immunology	4
BIO 400	Biological Chemistry	4
BIO 415	Medical Microbiology	4
BIO 420	Molecular Biology	4

At least 1 credit from List C

Bio 450	Biology Seminar	1
Bio 489	Introduction to Experimental Biology	1

Bio 490	Honors in Biological Sciences	3

Brain Sciences 20-22
Select courses from Lists: A, B, and C

13 credits from List A

BIO 320	Neural Development: From Genes and Cells to Brains	3
BIO 321	Neural Development Laboratory	2
BIO 340	Human Body and Brain	3
BIO 341	Human Body and Brain Laboratory	2
BIO 435	Neurophysiology	3

At least 1 credit from List B

BIO 450	Biology Seminar	1
BIO 489	Introduction to Experimental Biology	1
BIO 490	Honors in Biological Sciences	3

6 credits from List C

In Psychology: PSY 308 or 310 or 312 or 314 or 317 or 366

Note: PSY 308, 310, 312, 314, 317, and 366 have PSY 166 as a prerequisite.

Bioenvironmental Sciences 21-24
Select courses from Lists: A, B, and C or D

At least 14 credits from List A

BIO 241	Evolution Species and Biogeography	3
BIO 311	Parasitology	3
BIO 312	Parasitology Laboratory	2
BIO 330	Plant Physiology	4
BIO 331	Experimental Microbiology	4
BIO 336	Marine Biology	3
BIO 339	Ecology	4

At least 1 credit from List B

BIO 450	Biology Seminar	1
BIO 489	Introduction to Experimental Biology	1
BIO 490	Honors in Biological Sciences	3

6-7 credits from List C

In Geospatial Sciences: GEP 204 or GEP 205, and, GEP 321 or GEP 3750

Note: GEP 205 has GEO 101 or GEH 101 as a prerequisite, and GEP 3750 has GEP 204 or GEP 205 as a prerequisite.

OR

6 credits from List D

In Political Science: POL 3600 or POL 366 or POL 368 or POL 343

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

We are changing the requirements for the 70-credit biology major to provide students with a more rigorous background in biology that includes knowledge of genetics and statistics. Additionally, we have reorganized the electives so students can combine their knowledge of biology with other disciplines. By organizing the electives to create tracks of study and allowing students to take courses from other departments, we think that we will better prepare students for the job market and give them greater career options in STEM fields. The emphasis of our program on math and science courses and the additional requirements we are introducing necessitate that we change the degree from a B.A. to a B.S. The structure of our program is in line with Biology B.S. degrees offered by other CUNY colleges such as City College, York College, Staten Island.

5. **Date of departmental approval:** March 22, 2017

LEHMAN COLLEGE
OF THE
CITY UNIVERSITY OF NEW YORK

DEPARTMENT OF BIOLOGICAL SCIENCES

CURRICULUM CHANGE

Name of Program and Degree Award: Biological Sciences, Bachelor of Arts
Hegis Number: 0401.00
Program Code: 25940
Effective Term: Spring 2018

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

2. **From:**
Biology II, B.A. (53 Credit Major)

This major sequence in Biology is appropriate only for students planning to teach in middle and high school. The required education sequence in middle and high school education must be completed for all students selecting this major in Biology. As part of their overall training students in science, students will be required to take ESC 419.

The required courses and credits are distributed as follows:

8 credits in:

		Credits
BIO 166	Principles of Biology: Cells and Genes	4
BIO 167	Principles of Biology: Organisms	4

BIO 166, BIO 167: One counts as General Education and the other toward the major. Both are prerequisites to all other Biology courses.

~~20 credits in Advanced Biology Courses:~~

~~(12 of which must be at the 300 level or higher)~~

~~Suggested Courses:~~

		~~Credits~~
~~BIO 238~~	~~Genetics~~	~~4~~
~~BIO 241~~	~~Evolution, Species, and Biogeography~~	~~3~~
~~BIO 227~~	~~Mammalian Histology~~	~~4~~
~~BIO 228~~	~~Mammalian Physiology~~	~~4~~
~~BIO 339~~	~~Ecology~~	~~4~~

~~BIO 432 Biological Fine Structure 3~~

~~BIO 433 Techniques in Electron Microscopy 3~~

5 credits in physics:

		Credits
PHY 166	General Physics I	5

15 credits in chemistry:

		Credits
CHE 166	General Chemistry I	4
CHE 167	General Chemistry Laboratory I	1.5
CHE 168	General Chemistry II	4
CHE 169	General Chemistry Laboratory II	1.5
CHE 232	Organic Chemistry Lecture I	3
CHE 233	Organic Chemistry Laboratory I	2

~~5 courses in mathematics:~~

		~~Credits~~
~~MAT 155~~	~~Calculus I Laboratory~~	~~1~~
~~MAT 175~~	~~Calculus I~~	~~4~~

3. **To:**
Biology II, B.A. (53 Credit Major)

This major sequence in Biology is appropriate only for students planning to teach in middle and high school. The required education sequence in middle and high school education must be completed for all students selecting this major in Biology. As part of their overall training students in science, students will be required to take ESC 419.

The required courses and credits are distributed as follows:

8 credits in:

		Credits
BIO 166	Principles of Biology: Cells and Genes	4
BIO 167	Principles of Biology: Organisms	4

BIO 166, BIO 167: One counts as General Education and the other toward the major. Both are prerequisites to all other Biology courses.

5 credits in physics:

		Credits
PHY 166	General Physics I	5

15 credits in chemistry:

		Credits
CHE 166	General Chemistry I	4
CHE 167	General Chemistry Laboratory I	1.5
CHE 168	General Chemistry II	4
CHE 169	General Chemistry Laboratory II	1.5
CHE 232	Organic Chemistry Lecture I	3
CHE 233	Organic Chemistry Laboratory I	2

3 credits in Mathematics

		Credits
MAT 128	Foundations of Data Science	3

At least 22 credits in advanced Biology courses from 3 areas: Credits

At least two courses from Cellular Biology

BIO 238	Genetics	4
BIO 268	Vertebrate Embryology	4
BIO 311	Parasitology	3
BIO 320	Neural Development: From Genes and Cells to Brains	3
BIO 331	Experimental Microbiology	4
BIO 338	Genetics of Man	4
BIO 350	Introduction to Immunology	4
BIO 400	Biological Chemistry	4
BIO 406	Biochemistry of Differentiation	4
BIO 415	Medical Microbiology	4
BIO 420	Molecular Biology	4
BIO 465	Microbial Physiology and Genetics	4

At least one course from Organismic Biology

BIO 228	Mammalian Physiology	4
BIO 267	Comparative Anatomy of Vertebrates	4
BIO 270	Invertebrate Zoology	3
BIO 330	Plant Physiology	4
BIO 333	Endocrine Physiology	4
BIO 340	Human Body and Brain	3
BIO 431	Comparative Animal Physiology	4
BIO 435	Neurophysiology	3

At least one course from Population Biology

BIO 241	Evolution Species and Biogeography	3
BIO 336	Marine Biology	3
BIO 339	Ecology	4
BIO 401	Biological Systematics	4

4. **Rationale (Explain how this change will impact learning outcomes of the department and Major/Program):**
We are changing the requirements for the 53-credit biology major to better guide students in choosing their electives. In the revised curriculum, students must take courses from specific sub-fields of biology so they are exposed to a wider range of topics necessary for teaching biology at the high school level. We are also changing the math requirements to help students achieve the quantitative skills that are needed for teaching experimental biology.

5. **Date of departmental approval:** April 19, 2017

LEHMAN COLLEGE
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DEPARTMENT OF BIOLOGICAL SCIENCES

CURRICULUM CHANGE

1. **Type of Change:** Course description and prerequisite

2. **From:**

Department(s)	Biological Sciences
Career	[X] Undergraduate [ ] Graduate
Academic Level	[X] Regular [ ] Compensatory [ ] Developmental [ ] Remedial
Subject Area	Biology
Course Prefix & Number	BIO 489
Course Title	Introduction to Experimental Biology
Description	Individual laboratory investigation for advanced students, under the guidance of a faculty member.
Pre/ Co Requisites	~~Sponsorship of a faculty member, Departmental permission prior to preliminary registration, and 15 BIO credits.~~
Credits	1 (maximum 3 credits).
Hours	1
Liberal Arts	[X] Yes [ ] 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. **To:**

Department(s)	Biological Sciences
Career	[X] Undergraduate [ ] Graduate
Academic Level	[X] Regular [ ] Compensatory [ ] Developmental [ ] Remedial
Subject Area	Biology
Course Prefix & Number	BIO 489
Course Title	Introduction to Experimental Biology
Description	Individual laboratory investigation for advanced students, under the guidance of a faculty member. Students are required to submit a written report of their laboratory investigation to the faculty member.
Pre/ Co Requisites	Completion of 15 credits in BIO courses, sponsorship of a faculty member, and department permission.
Credits	1 (may be repeated for a maximum 3 credits).
Hours	1
Liberal Arts	[X] Yes [ ] 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

4. **Rationale (Explain how this change will impact the learning outcomes of the department and Major/Program):** To encourage students to write research reports that would improve their understanding of the project and their science writing skill.

5. **Date of departmental approval:** April 19, 2017

LEHMAN COLLEGE
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DEPARTMENT OF BIOLOGICAL SCIENCES

CURRICULUM CHANGE

1. **Type of Change:** Course description

2. **From:**

Department(s)	Biological Sciences
Career	[X] Undergraduate [ ] Graduate
Academic Level	[X] Regular [ ] Compensatory [ ] Developmental [ ] Remedial
Subject Area	Biology
Course Prefix & Number	BIO 490
Course Title	Honors in Biological Sciences
Description	Independent laboratory investigation for advanced students, under the guidance of a faculty member (minimum of 90 hours). ~~A GPA of 3.0 or better at the time of registration, satisfactory completion of 18 credits in BIO or related fields, including either PHY 167 or 169, plus CHE 234-235, and endorsement by a faculty member to be submitted to the Chair prior to preliminary registration.~~
Pre/ Co Requisites	~~Department Consent Required~~
Credits	3
Hours	3
Liberal Arts	[X] Yes [ ] 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. **To:**

Department(s)	Biological Sciences
Career	[X] Undergraduate [ ] Graduate
Academic Level	[X] Regular [ ] Compensatory [ ] Developmental [ ] Remedial
Subject Area	Biology
Course Prefix & Number	BIO 490
Course Title	Honors in Biological Sciences
Description	Independent laboratory investigation for advanced students, under the guidance of a faculty member (minimum of 90 hours). Students are required to create and present a poster of their research at annual meetings that are held either within or outside of Lehman College.
Pre/ Co Requisites	A GPA of 3.0 or better, completion of 18 credits in BIO or related fields, including either PHY 167 or PHY 169, plus CHE 234 and CHE 235, sponsorship of a faculty member and department permission.
Credits	3
Hours	3
Liberal Arts	[X] Yes [ ] 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

4. **Rationale (Explain how this change will impact the learning outcomes of the department and Major/Program):** To encourage students to write and present their research findings that would improve their written and oral skills.

5. **Date of departmental approval:** April 19, 2017

LEHMAN COLLEGE
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DEPARTMENT OF BIOLOGICAL SCIENCES

CURRICULUM CHANGE

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

2.

Department(s)	Biological Sciences
Career	[X] Undergraduate [ ] Graduate
Academic Level	[ ] Regular [ ] Compensatory [X] Developmental [ ] Remedial
Subject Area	Biology
Course Prefix & Number	BIO 189
Course Title	Introduction to Experimental Biology
Description	Introduction to experimental methods in biological sciences. This course does not count towards the biology major or minor.
Pre/ Co Requisites	
Credits	1
Hours	2 (lab)
Liberal Arts	[X] Yes [ ] 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:** To engage entry-level students in research so they are better prepared for advanced biology courses and can gain research experience at an earlier stage in their

academic career.

4. **Learning Outcomes (By the end of the course students will be expected to):**
   - Understand the scientific method.
   - Understand how hypotheses are generated and tested.
   - Become familiar with basic laboratory techniques in biological sciences.
   - Understand how research is conducted to solve real-world problems.
   - Learn how to search for scientific literature and critically read science news.
   - Be able to follow laboratory protocols, keep an accurate record of the data, and analyze data ethically.
   - Be able to foster and maintain a relationship with research mentors.
   - Be able to present results to the scientific community and the general public.

5. **Date of Departmental Approval:** April 19, 2017