

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

DEPARTMENT OF PHYSICS AND ASTRONOMY

CURRICULUM CHANGE

Name of Program and Degree Award: Physics, B.S.

Hegis Number: 1902.00

Program Code: 34031

Effective Term: Fall 2018

1. **Type of Change:** Course Requirements for the B.S. Physics Program

2. **From:**
Physics, B.S. (60 Credit Major)

The B.S. program in Physics is designed for students who are planning a career in physics research and/or college-level teaching. Any student following this program may select the B.A. degree instead of the B.S. degree. The minimum of 60 required credits is distributed as follows:

Credits (60)

36 Required PHY courses: PHY 168, 169, 207, 251, ~~300~~, 301, 302, 303, 400. With permission from the Chair students may take PHY 166, 167 in place of PHY 168, 169.

6 At least two additional PHY or AST courses at the 200 level or above. With permission from the Chair one of these additional courses may be at the 100 level.

12 Required MAT courses: MAT 175, 176, 226.

6 At least two additional MAT courses at the 200 level or above.

3. **To:**
Physics, B.S. (60 Credit Major)

The B.S. program in Physics is designed for students who are planning a career in physics research and/or college-level teaching. Any student following this program may select the B.A. degree instead of the B.S. degree. The minimum of 60 required credits is distributed as follows:

Credits (60)

36 Required PHY courses: PHY 168, 169, 207, 241, 251, 301, 302, 303, 400. With permission from the Chair students may take PHY 166, 167 in place of PHY 168, 169.

6 At least two additional PHY or AST courses at the 200 level or above. With permission from the Chair one of these additional courses may be at the 100 level.

12 Required MAT courses: MAT 175, 176, 226.

6 At least two additional MAT courses at the 200 level or above.

4. **Rationale:**

This change updates the degree requirements to reflect a previous curriculum change in which PHY 300 was re-numbered as PHY 241.

5. **Date of departmental approval:** February 28, 2018

**LEHMAN COLLEGE
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CITY UNIVERSITY OF NEW YORK**

DEPARTMENT OF PHYSICS AND ASTRONOMY

CURRICULUM CHANGE

Name of Program and Degree Award: Physics, B.A.

Hegis Number: 1902.00

Program Code: 34052

Effective Term: Fall 2018

1. **Type of Change:** Course Requirements for the B.A. Physics Program

2. **From:**
Physics, B.A. (38 Credit Major)

The B.A. program in Physics is designed for students who, although not planning a career in physics research or college-level teaching, have a strong interest in physical science, particularly physics, and wish to prepare for a career in which a good basic knowledge of physics is useful. Among such careers are the health professions, elementary and secondary school science teaching, patent-law practice, industrial management, and science journalism. The minimum of 38 required credits is distributed as follows:

Credits (38)

14 Required PHY courses: PHY 168, 169, 207. With permission from the Chair students may take PHY 166, 167 in place of PHY 168, 169.

12 At least four additional PHY or AST courses at the 200 level or above. With permission from the Chair one of these additional courses may be at the 100 level.

12 Required MAT courses: MAT 175, 176, 226.

3. **To:**
Physics, B.A. (38 Credit Major)

The B.A. program in Physics is designed for students who, although not planning a career in physics research or college-level teaching, have a strong interest in physical science, particularly physics, and wish to prepare for a career in which a good basic knowledge of physics is useful. Among such careers are the health professions, elementary and secondary school science teaching, patent-law practice, industrial management, and science journalism. The minimum of 38 required credits is distributed as follows:

Credits (38)

14 Required PHY courses: PHY 168, 169, 207. With permission from the Chair students may take PHY 166, 167 in place of PHY 168, 169.

12 At least four additional PHY or AST courses at the 200 level or above. With permission from the Chair one of these additional courses may be at the 100 level. No more than one of these additional courses may be chosen from PHY 487 and PHY 489.

12 Required MAT courses: MAT 175, 176, 226.

4. **Rationale:**

The internship course PHY 487 and the research course PHY 489 can be used as electives toward a physics BA degree, but they should not be used to replace too many physics content electives. This proposal limits the number of PHY 487 and PHY 489 courses which count toward a BA degree so that students are required to take at least three physics content electives.

5. **Date of departmental approval:** February 28, 2018

**LEHMAN COLLEGE
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DEPARTMENT OF PHYSICS AND ASTRONOMY

CURRICULUM CHANGE

Name of Program and Degree Award: Physics, Minor
Effective Term: Fall 2018

1. **Type of Change:** Course Requirements for the Minor in Physics Program

2. **From:**
Minor in Physics (19 Credit Minor)

The Minor in Physics is designed for students who are interested in physics and want to go beyond the basic introductory courses. The minimum of 19 required credits is distributed as follows.

10 Required PHY courses: either PHY 166, 167 or PHY 168, 169.

9 At least three additional PHY or AST courses at the 200 level or above. With permission from the Chair one of these additional courses may be at the 100 level.

3. **To:**
Minor in Physics (19 Credit Minor)

The Minor in Physics is designed for students who are interested in physics and want to go beyond the basic introductory courses. The minimum of 19 required credits is distributed as follows.

10 Required PHY courses: either PHY 166, 167 or PHY 168, 169.

9 At least three additional PHY or AST courses at the 200 level or above. With permission from the Chair one of these additional courses may be at the 100 level. No more than one of these additional courses may be chosen from PHY 487 and PHY 489.

4. **Rationale:**
The internship course PHY 487 and the research course PHY 489 can be used as electives toward a physics minor, but they should not be used to replace too many physics content electives. This proposal limits the number of PHY 487 and PHY 489 courses which count toward a minor so that students are required to take at least two physics content electives.

5. **Date of departmental approval:** February 28, 2018

**LEHMAN COLLEGE
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DEPARTMENT OF PHYSICS AND ASTRONOMY

CURRICULUM CHANGE

1. **Type of Change:** Change in prerequisites

2. **From:**

Department(s)	Physics and Astronomy
Career	<input checked="" type="checkbox"/> Undergraduate [] Graduate
Academic Level	<input checked="" type="checkbox"/> Regular [] Compensatory [] Developmental [] Remedial
Subject Area	Astronomy
Course Prefix & Number	AST 306
Course Title	Astrophysics
Description	Selected topics from celestial mechanics and stellar dynamics; stellar energy sources, pulsars, quasars, black holes, and relativistic cosmology.
Pre/ Co Requisites	PREREQ: MAT 175; either PHY 167 or 169; PHY 300 recommended but not required.
Credits	3
Hours	3
Liberal Arts	<input checked="" type="checkbox"/> Yes [] No
Course Attribute (e.g. Writing Intensive, WAC, etc)	NA
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. To:

Department(s)	Physics and Astronomy
Career	<input checked="" type="checkbox"/> Undergraduate [] Graduate
Academic Level	<input checked="" type="checkbox"/> Regular [] Compensatory [] Developmental [] Remedial
Subject Area	Astronomy
Course Prefix & Number	AST 306
Course Title	Astrophysics
Description	Selected topics from celestial mechanics and stellar dynamics; stellar energy sources, pulsars, quasars, black holes, and relativistic cosmology.
Pre/ Co Requisites	PREREQ: MAT 175; either PHY 167 or 169; PHY <u>241</u> recommended but not required.
Credits	3
Hours	3
Liberal Arts	<input checked="" type="checkbox"/> Yes [] No
Course Attribute (e.g. Writing Intensive, WAC, etc)	NA
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:

This change updates the course prerequisites to reflect a previous curriculum change in which PHY 300 was re-numbered as PHY 241.

5. Date of departmental approval: February 28, 2018

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CURRICULUM CHANGE

1. **Type of Change:** Change in prerequisites

2. **From:**

Department(s)	Physics and Astronomy
Career	<input checked="" type="checkbox"/> Undergraduate [] Graduate
Academic Level	<input checked="" type="checkbox"/> Regular [] Compensatory [] Developmental [] Remedial
Subject Area	Astrophysics
Course Prefix & Number	PHY 306
Course Title	Astrophysics
Description	Selected topics from celestial mechanics and stellar dynamics; stellar energy sources, pulsars, quasars, black holes, and relativistic cosmology.
Pre/ Co Requisites	PREREQ: MAT 175; either PHY 167 or 169; PHY 300 recommended but not required.
Credits	3
Hours	3
Liberal Arts	<input checked="" type="checkbox"/> Yes [] No
Course Attribute (e.g. Writing Intensive, WAC, etc)	NA
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. To:

Department(s)	Physics and Astronomy
Career	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
Academic Level	<input checked="" type="checkbox"/> Regular <input type="checkbox"/> Compensatory <input type="checkbox"/> Developmental <input type="checkbox"/> Remedial
Subject Area	Astrophysics
Course Prefix & Number	PHY 306
Course Title	Astrophysics
Description	Selected topics from celestial mechanics and stellar dynamics; stellar energy sources, pulsars, quasars, black holes, and relativistic cosmology.
Pre/ Co Requisites	PREREQ: MAT 175; either PHY 167 or 169; PHY <u>241</u> recommended but not required.
Credits	3
Hours	3
Liberal Arts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Course Attribute (e.g. Writing Intensive, WAC, etc)	NA
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

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CURRICULUM CHANGE

1. **Type of Change:** Change in prerequisites

2. **From:**

Department(s)	Physics and Astronomy
Career	<input checked="" type="checkbox"/> Undergraduate [] Graduate
Academic Level	<input checked="" type="checkbox"/> Regular [] Compensatory [] Developmental [] Remedial
Subject Area	Physics
Course Prefix & Number	PHY 400
Course Title	Introductory Quantum Mechanics
Description	Wave and particle nature of matter and radiation. The uncertainty principle. Operators and the Eigen-value equations; Schrodinger formulation; stationary states. Harmonic oscillator and potential barrier problems. Angular momentum. Central potential and the hydrogen atom. Perturbation theory of energy levels. Spin and statistics.
Pre/ Co Requisites	PREREQ: PHY 300. COREQ: Either MAT 313 or MAT 323 or departmental permission.
Credits	4
Hours	4
Liberal Arts	<input checked="" type="checkbox"/> Yes [] No
Course Attribute (e.g. Writing Intensive, WAC, etc)	NA
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

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3. To:

Department(s)	Physics and Astronomy
Career	<input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
Academic Level	<input checked="" type="checkbox"/> Regular <input type="checkbox"/> Compensatory <input type="checkbox"/> Developmental <input type="checkbox"/> Remedial
Subject Area	Physics
Course Prefix & Number	PHY 400
Course Title	Introductory Quantum Mechanics
Description	Wave and particle nature of matter and radiation. The uncertainty principle. Operators and the Eigen-value equations; Schrodinger formulation; stationary states. Harmonic oscillator and potential barrier problems. Angular momentum. Central potential and the hydrogen atom. Perturbation theory of energy levels. Spin and statistics.
Pre/ Co Requisites	PREREQ: PHY 241. COREQ: Either MAT 313 or MAT 323 or departmental permission.
Credits	4
Hours	4
Liberal Arts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Course Attribute (e.g. Writing Intensive, WAC, etc)	NA
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

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