

B.S. in Physics

Academic Program Guide for **New First-Year Students** (Effective Fall 2020)

Department of Physics & Astronomy (physics@rowan.edu)

Students who entered Rowan University prior to Fall 2018 should follow the guide for their program and start year in consultation with their advisor.

Rowan University Graduation Requirements for all Majors / Degrees

- Students must complete at least 120 semester hours (sh) of coursework that apply to their Rowan University degree.
- Students must have a cumulative GPA of at least 2.0 in Rowan University coursework. (Transfer courses/credit do not count toward the RU GPA.)
- A minimum of 30 sh of coursework must be completed at/through Rowan University.
- Only grades of “D–” or above may apply to graduation/degree requirements. (Some programs may set higher minimums.)
- Students must meet the Rowan Core and Rowan Experience Requirements.
 - An individual course can potentially satisfy one Rowan Core literacy and/or multiple Rowan Experience attributes.
 - Rowan Core and Rowan Experience designations are listed in course details in Section Tally (www.rowan.edu/registrar) and may also be searched on that site under “Attributes.” A list of Rowan Core courses is here: <https://confluence.rowan.edu/display/AS/Rowan+Core+Course+List>.
- Students must apply for graduation and should do so for the term in which they will complete all program requirements.

Rowan Core Requirements¹

Students must satisfy all six Rowan Core Literacies. A minimum total of 3 sh of coursework is required to satisfy each Literacy.

With the exception of the 9 sh counted here for Communicative Literacy, credits attached to the courses in this section will apply elsewhere.

- (COML) Communicative Literacy: *Must be met by the following three courses or their official equivalents:*
 - COMP 01 111 College Composition I (3 sh) ○ COMP 01 112 College Composition II (3 sh) ○ CMS 04 205 Public Speaking (3 sh)
- (ARTL) Artistic Literacy *Recommendation from major:*
- (GLBL) Global Literacy *Recommendation from major:*
- (HUML) Humanistic Literacy *Recommendation from major:* PHIL 09 369 (3 sh counted under non-program)
- (QNTL) Quantitative Literacy *Recommendation from major:* MATH 01 130 (4 sh counted under non-program)
- (SCIL) Scientific Literacy *Recommendation from major:* PHYS 00 220 (4 sh counted under major)

Subtotal of credits counted in this section: 9 sh

Rowan Experience Requirements

Students must satisfy all three Rowan Experience attributes. Credits attached to the courses in this section will apply elsewhere.

- (LIT) Broad-Based Literature Attribute *Recommendation from major:*
- (WI) Writing Intensive Attribute *Recommendation from major:* PHIL 09 369 (3 sh counted under non-program)
- (RS) Rowan Seminar Attribute² *Recommendation from major:* PHYS 00 130 (1 sh counted under major requirements)

Non-Program Courses (minimum 19 sh)

Courses in this section cannot be in the major department.

| Course # | Course Name | Course Attributes/Notes | Sem/Yr | Grade | Credits |
|---------------------|---|-----------------------------|--------|-------|---------|
| CS 04 103 or 01 104 | Computer Science & Programming or Intro to Scientific Programming | CS&P preferred ³ | | | 4 |
| PHIL 09 369 | Philosophy of Science-WI | Satisfies Humanistic & WI | | | 3 |
| MATH 01 130 | Calculus I | Satisfies Quantitative | | | 4 |

Then choose one of the following course sequences:

| Course # | Course Name | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|--|---|---------------------------|--------|-------|---------|
| ○ Biology sequence (take the following two courses): | | | | | |
| MCB 01 101 | Foundations in Biology for Biomedical Sciences I | | | | 4 |
| MCB 01 102 | Foundations in Biology for Biomedical Sciences II | | | | 4 |
| ○ Chemistry sequence (take the following two courses): ⁴ | | | | | |
| CHEM 06 100 | Chemistry I | | | | 4 |
| CHEM 06 101 | Chemistry II | | | | 4 |
| ○ Computer Science sequence (take 8 credits of courses to fulfill CS Minor or CUGS): | | | | | |
| CS | | | | | 4 |
| CS | | | | | 4 |
| ○ Other sequence (proposed by student and approved by advisor): | | | | | |
| | | | | | 4 |
| | | | | | 4 |
| Subtotal: 19 sh | | | | | |

¹ The Rowan Core requirements are waived for transfer students with an earned A.A. or A.S. degree from a NJ community/county college.

² The Rowan Seminar requirement is waived for all students transferring 24 or more approved credits into Rowan University at the time of initial entry.

³ Students in a CS minor or CUGS may apply CS 04 113 (or other required course) here instead and using additional courses for the CS sequence below

⁴ Chemistry sequence recommended for those considering teaching, along with two more CHEM courses for Physical Science certification.

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Major Requirements (61 sh)

SUMMARY OF MAJOR REQUIREMENTS

- 21 sh of Foundational Courses
 - 14 sh of Mid-Level Courses
 - 15 sh of Upper-Level Courses
 - 11 sh of Restricted Electives
-
- 61 sh total

FOUNDATIONAL COURSES

| Course # | Course Name | Course Designations/Notes | Sem/Yr | Grade | Credits |
|-------------|--|-------------------------------|--------|-------|-----------------|
| MATH 01 131 | Calculus II | | | | 4 |
| MATH 01 230 | Calculus III | | | | 4 |
| PHYS 00 130 | Building Momentum as a Physics Student at Rowan and Beyond | Satisfies Rowan Seminar | | | 1 |
| PHYS 00 220 | Introductory Mechanics | Satisfies Scientific Literacy | | | 4 |
| PHYS 00 221 | Introductory Thermodynamics, Fluids, Waves, & Optics | | | | 4 |
| PHYS 00 222 | Introductory Electricity & Magnetism | | | | 4 |
| | | | | | Subtotal: 21 sh |

MID-LEVEL COURSES

Choose one of the following two-course sequences.

| Course # | Course Name | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|-----------------------------------|------------------------------------|---------------------------|--------|-------|---------|
| <input type="radio"/> MATH 01 231 | Linear Algebra | | | | 3 |
| <input type="radio"/> MATH 01 210 | Differential Equations | | | | 3 |
| <input type="radio"/> PHYS 00 330 | Mathematical Methods for Physics | | | | 3 |
| | Any additional Restricted Elective | | | | 3 |

Then take the following three courses.

| Course # | Course Name | Course Designations/Notes | Sem/Yr | Grade | Credits |
|-------------|-----------------------------|---------------------------|--------|-------|-----------------|
| PHYS 00 300 | Modern Physics | | | | 4 |
| PHYS 00 351 | Physics Research Methods I | | | | 2 |
| PHYS 00 352 | Physics Research Methods II | | | | 2 |
| | | | | | Subtotal: 14 sh |

UPPER-LEVEL COURSES

| Course # | Course Name | Course Designations/Notes | Sem/Yr | Grade | Credits |
|-------------|---------------------------|---------------------------|--------|-------|-----------------|
| PHYS 00 310 | Analytical Mechanics | | | | 4 |
| PHYS 00 320 | Electricity & Magnetism I | | | | 4 |
| PHYS 00 410 | Quantum Mechanics I | | | | 4 |
| PHYS 00 430 | Statistical Physics | | | | 3 |
| | | | | | Subtotal: 15 sh |

RESTRICTED ELECTIVES (CHOOSE 11 SH FROM THE FOLLOWING LIST)

- **Physics:** any 300+ level Physics (PHYS 00) course
 - 3 sh max of Physics/Astronomy Research I, II, III, IV (PHYS 00 250, 00 251, 00 350 or 00 450; ASTR 11 250, 11 251, 11 350 or 11 450)
 - 4 sh max of Physics Learning Assistant for... (PHYS 00 361, 00 362 or 00 363)
- **Astronomy:** any 200+ level Astronomy (ASTR 11) course
- **Geology:** any Geology course
- **Materials Science:** either Material Science (ENGR 01 281) or Interdisciplinary Materials Science (INTR 01 486)
- **Engineering:** any 300+ level Engineering course
- **Mathematics:** any 200+ level Math course
- **Chemistry:** any 200+ level Chemistry (except Chemistry in Environment)
- **Computer Science:** any 200+ level Computer Science course
- **Biology:** any Biology course

| Course # | Course Name | Course Designations/Notes | Sem/Yr | Grade | Credits |
|----------|-------------|---------------------------|--------|-------|-----------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | Subtotal: 11 sh |

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Free Electives for this Major/Degree (31 sh)

Students should choose Free Electives that satisfy any Rowan Core or Rowan Experience requirements that are not fulfilled by Major or Non-Program courses.

| Course # | Course Name | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|----------|-------------|---------------------------|--------|-------|---------|
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Subtotal: 31 sh

Total Program Credits Required for this Major / Degree: 120 SH