

B.S. in Physics – Photonics Concentration

Academic Program Guide for **New First-Year Students** (Effective Fall 2018)

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 01111 College Composition I (3 sh) ○ COMP 01112 College Composition II (3 sh) ○ CMS 04205 Public Speaking (3 sh)
- (ARTL) Artistic Literacy *Recommendation from major:*
- (GLBL) Global Literacy *Recommendation from major:*
- (HUML) Humanistic Literacy *Recommendation from major:* PHIL 09369 (3 sh counted under non-program)
- (QNTL) Quantitative Literacy *Recommendation from major:* MATH 01130 (4 sh counted under non-program)
- (SCIL) Scientific Literacy *Recommendation from major:* PHYS 00220 (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 09369 (3 sh counted under non-program)
- (RS) Rowan Seminar Attribute² *Recommendation from major:*

Non-Program Courses (minimum 18 sh)

Courses in this section cannot be in the major department.

Course #	Course Name	Course Attributes/Notes	Sem/Yr	Grade	Credits
CS 01103 or 04104	Computer Science & Programming or Intro to Scientific Programming				4
PHIL 09369	Philosophy of Science-WI	Satisfies Humanistic & WI			3
MATH 01130	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):					
BIOL 01104	Diversity, Evolution and Adaptation				4
BIOL 01106	Concepts in Genetics				4
○ Chemistry sequence (take the following two courses): ³					
CHEM 06100	Chemistry I				4
CHEM 06101	Chemistry II				4
○ Computer Science sequence (take any two of the following three courses):					
CS 04113	Introduction to Object-Oriented Programming				4
CS 04114	Data Abstraction				4
CS 06205	Computer Organization				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 Chemistry sequence recommended for those considering teaching, along with two more CHEM courses for Physical Science certification.

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Major Requirements (60 sh)

SUMMARY OF MAJOR REQUIREMENTS

- 20 sh of Foundational Courses
 - 15 sh of Mid-Level Courses
 - 15 sh of Upper-Level Courses
 - 10 sh of Restricted Electives
-
- 60 sh total

FOUNDATIONAL COURSES

Course #	Course Name	Course Designations/Notes	Sem/Yr	Grade	Credits
MATH 01131	Calculus II				4
MATH 01230	Calculus III				4
PHYS 00220	Introductory Mechanics-RS	Satisfies Scientific Literacy			4
PHYS 00221	Introductory Thermodynamics, Fluids, Waves, & Optics				4
PHYS 00222	Introductory Electricity & Magnetism				4
Subtotal:					20 sh

MID-LEVEL COURSES

Course #	Course Name	Course Designations/Notes	Sem/Yr	Grade	Credits
PHYS 00340	Optics and Light				4
PHYS 00330	Mathematical Physics				3
PHYS 00300	Modern Physics				4
PHYS 00351	Physics Research Methods I				2
PHYS 00352	Physics Research Methods II				2
Subtotal:					15 sh

UPPER-LEVEL COURSES

Course #	Course Name	Course Designations/Notes	Sem/Yr	Grade	Credits
PHYS00 310	Analytical Mechanics				4
PHYS00 320	Electricity & Magnetism I				4
PHYS00 410	Quantum Mechanics I				4
PHYS00 430	Statistical Physics				3
Subtotal:					15 sh

RESTRICTED ELECTIVES

Take the following two courses plus a total of 4 sh of any combination of Physics Research I-IV: PHYS 00250, 00251, 00350, 00450 in an optics field.

Course #	Course Name	Course Attributes / Notes	Sem/Yr	Grade	Credits
<input type="radio"/> PHYS00 345	Introduction to Optical Design Program ZEMAX				3
<input type="radio"/> PHYS00 321	Electricity & Magnetism II				3
<input type="radio"/>					
<input type="radio"/>					
Subtotal:					10 sh

Free Electives for this Major/Degree (32 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
Subtotal:					32 sh

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