B.S. in Physics – Photonics Concentration

Academic Program Guide for **New First-Year Students** (Effective Fall 2022)
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 Requirements[1]

*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 09 261 (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 09 261 (3 sh counted under non-program)
◯ (RS) Rowan Seminar Attribute[2] *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 04 103 or 01 104	Computer Science & Programming or Intro to Scientific Programming	CS&P preferred[3]			4
PHIL 09 261	Philosophical Perspectives on 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):					
	BIOL 01 104	Diversity, Evolution and Adaptation				4
	BIOL 01 106	Concepts in Genetics				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	Introduction to Object-Oriented Programming				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 the CS minor may apply CS 04 113 here instead using it for the CS sequence below
[4] Chemistry sequence recommended for those considering teaching, along with two more CHEM courses for Physical Science certification.

B.S. in Physics - Photonics Concentration

Major Requirements (60 sh)

Summary of Major Requirements

- 21 sh of Foundational Courses
- 15 sh of Mid-Level Courses
- 15 sh of Upper-Level Courses
- 10 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

Course #	Course Name	Course Designations/Notes	Sem/Yr	Grade	Credits
PHYS 00 340	Optics and Light				4
PHYS 00 330	Mathematical Methods for Physics				3
PHYS 00 300	Modern Physics				4
PHYS 00 351	Physics Research Methods I				2
PHYS 00 352	Physics Research Methods II				2
				Subtotal: 15 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

Take the following three courses.

	Course #	Course Name	Course Attributes / Notes	Sem/Yr	Grade	Credits
◯	PHYS 00 345	Introduction to Optical Design				4
◯	PHYS 00 321	Electricity & Magnetism II				3
◯	PHYS 00 347	Laser Physics				3
					Subtotal: 10 sh	

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
				Subtotal: 31 sh	

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