The City University of New York

Articulation Agreement Between

Queensborough Community College

and

Queens College

A. Sending and Receiving Institutions

Sending Institution: Queensborough Community College

Department: Physics Program: Physics

Degree: Associate of Science (A.S.)

Receiving Institution: Queens College

Department: Physics Program: Physics

Degree: Bachelor of Arts (B.A.)

B. Admission Requirements for Queens College Physics Program

Minimum GPA: 2.0

To take advantage of this articulation agreement, students must complete the A.S. in Physics at Queensborough Community College prior to transfer to Queens College. Upon transfer, students must declare a major in Physics. All transfer courses credited toward the physics major must be completed with a grade of C- or better.

The equivalencies in this agreement assume that the student has completed their Associate's degree. Course equivalency information will be entered in both the *University Course Guide* database and the Website. When the receiving college awards transfer credit for either a block of courses or for an entire program rather than for individual courses, it may not be necessary to list individual course equivalencies.

Total transfer credits granted toward the baccalaureate degree: <u>60 credits</u>. Total additional credits required at the Queens College to complete the baccalaureate degree: <u>60 credits</u>

C. Course-to-Course Equivalencies and Transfer Credit Awarded

Queensborough Community College		Queens College			
				Transfer	
				Credits	
Course and Title	Credit	Course and Title	Credit	Awarded	
Common Core Requirements		Course Equivalency			
Required Core 1A:		English Composition 1 and 2:		_	
ENGL-101 English Composition I ENGL-102 English Composition II	3	ENGL 110 College Writing I	3	3 3	
Required Core 1B:	3	ENGL 130 Writing about Literature in English Math and Quantitative Reasoning:			
MA-440 Pre-Calculus Mathematics _{1,2}	4	MATH 122 Precalculus	4	4	
Required Core 1C:					
PH-421 General Calculus Physics A	5	PHYS 145 Principles of Physics I and Lab	5	5	
Flexible Core 2A: Select any courses in 2A	3	World Cultures and Global Issues	3	3	
Flexible Core 2B: Select any courses in 2B	3	US Experience in Its Diversity	3	3	
Flexible Core 2C: Select any courses in 2C	3	Creative Expression	3	3	
,		·	-		
Flexible Core 2D: Select any courses in 2D	3	Individual and Society	3	3	
Flexible Core 2E: PH-422 General Calculus Physics B	5	PHYS 146 Principles of Physics II and Lab	5	5	
Additional Flexible Core Course:	4	Additional Flexible Core Course: MATH 151	4	4	
MA-441 Analytic Geometry and Calculus I ₂		Calculus/Differentiation and Integration			
Subtotal	36		Subtotal	36	
Requirements for the Major	4	Course Equivalency			
PH-160 Physics Colloquium	1	PHYS 380 Colloquium	1	1	
PH-440 Modern Physics	4	PHYS 260 Introduction to Modern Physics MATH 152 Calculus/Integration and Infinite	4	4	
MA-442 Analytic Geometry and Calculus II ₂	4	Series	4	4	
MA-443 Analytic Geometry and Calculus III	4	MATH 201 Multivariable Calculus	4	4	
One credit in PE-400, PE-500, or DAN-100 series	4			4	
(one credit courses only)	1	Elective Credit	_	1	
Subtotal	14		Subtotal	14	
Major Electives ₂		Course Equivalency			
Take 10 credits from the following list:					
CH-151 General Chemistry I	4.5	CHEM 113 General Chemistry I and Lab	5	4.5	
CH-152 General Chemistry II	4.5	CHEM 114 General Chemistry II and Lab	5	4.5	
MA-119 College Algebra	3	MATH 115 College Algebra for Precalculus	3	3	
MA-121 Trigonometry ₁	1	Elective Credit	1	1	
MA-451 Differential Equations	4	MATH 223 Differential Equations with	3	3	
MA-461 Linear Algebra	4	Numerical Methods I MATH 231 Linear Algebra I	4	4	
PH-240 Computerized Physical Measurement Using			4		
Graphical Programming	3	Elective Credit	-	3	
PH-414 Analytical Mechanics	4	PHYS 237 Mechanics	4	4	
PH-415 Electricity and Magnetism	4	PHYS 310 Electromagnetism 1	4	4	
PH-416 Thermodynamics	4	PHYS 242 Thermodynamics	3	3	
PH-450 Introduction to Physics Research	3	Elective Credit	_	3	
PH 451 Numerical Methods	3	PHYS 275 Intro. to Scientific Computing	4	3	
PH-501 Special Topics	3	PHYS 383 Special Topics	3	3	
PH-900 Independent Study Physics Research	2	Elective Credit	_	2	
		Additional Elective Credit	_	0-1	
Subtotal	10 ₂		Subtotal	10	
Total	60		Total	60	

Notes:

- 1. Depending on their math placement, students may be required to complete MA-119 and/or MA-121 (both with a C or better) prior to MA-440. When required by math placement, MA-119 and MA-121 will count as major electives.
- 2. Students who place into mathematics at MA-441 will use that course to satisfy Required Core 1B, use MA-442 in the Flexible Core, and take an additional 4 credits of major elective courses to reach 60 credits.

All Queensborough Community College students must complete at least two writing intensive courses, designated as "WI" in the course schedule. Transfer students must take at least one writing intensive course at Queens College, designated W, but this can overlap with the College Option Literature requirement and does not add to the required number of credits.

D. Senior College Courses Remaining for Baccalaureate Degree

Students pursuing the B.A. in Physics much choose either a Physics Option or an Applied Physics Option. Tables for both options are included below. Transfer students should consult with the major advisor in the Queens College Physics Department (info@physics.qc.cuny.edu) prior to enrolling in classes at Queens College.

Physics Option

Course and Title	Credits
College Option General Education Courses	
One Literature Course (LIT)	3
One Language Course (LANG)	3
Major Courses	
PHYS 222 Optics	3
PHYS 233 Intermediate Methods of Math Physics I	3
PHYS 234 Intermediate Methods of Math Physics II	3
PHYS 235 Classical Physics Laboratory	2
PHYS 237 Mechanics (or PH-414 at QCC)	0-4
PHYS 242 Thermodynamics OR PHYS 243 Thermodynamics and Statistical Mechanics (or PH-416 at QCC)	0-4
PHYS 310 Electromagnetism I (or PH-415 at QCC)	0-4
PHYS 365 Principles of Quantum Mechanics	4
PHYS 377 Modern Physics Laboratory	2
One 3- or 4-credit physics course at the 200 level or above (excluding PHYS 204 and 207).	3-4
Subtotal	26-39
Additional course work to reach 120 credits	21-34
Total credits to be earned at Queens College	60

Note: The above table assumes students completed MA-442, MA-443, and PH-440 at QCC. If those courses were not completed at QCC, then the courses must be completed at Queens College.

Applied Physics Option

Course and Title	Credits
College Option General Education Courses	
One Literature Course (LIT)	3
One Language Course (LANG)	3
Major Courses	
PHYS 225 Introduction to Solid State Electronics	4
PHYS 233 Intermediate Methods of Math Physics I	3
PHYS 235 Classical Physics Laboratory	2
PHYS 237 Mechanics (or PH-414 at QCC)	0-4
PHYS 242 Thermodynamics (or PH-416 at QCC)	0-3
PHYS 310 Electromagnetism I (or PH-415 at QCC)	0-4
PHYS 377 Modern Physics Laboratory	2
Three 3- or 4-credit physics course at the 200 level or above (excluding PHYS 204 and 207).	9-12
One science/mathematics course approved by the department (or CH-151 at QCC)	0-4
Subtotal	29-44
Additional course work to reach 120 credits	16-31
Total credits to be earned at Queens College	60

Note: The above table assumes students completed MA-442, MA-443, and PH-440 at QCC. If those courses were not completed at QCC, then the courses must be completed at Queens College.

E. Summary of credits required

Total credits to be earned at Queensborough Community College	60
Total credits to be earned at Queens College	60
Total credits required for the B.S. degree	120

F. Articulation Agreement Follow-up Procedures

Procedures for reviewing, updating, modifying, or terminating the agreement:

This agreement will be valid for 3 academic years from the Effective Date (below). Each year, there will be a review of the agreement's effectiveness by the Academic Affairs Officers at each institution.

When any of the programs within this agreement undergo any changes relevant to this agreement, this agreement will be reviewed and revised as necessary by the Curriculum Committees of both the sending and receiving program.

Either party may independently cancel this agreement by notifying the other party no less than one academic year before the intended date of cancellation.

Procedures for evaluating agreement:

The academic department, advisement centers, and Offices of Institutional Effectiveness from each campus will keep data on the academic progress of the transfer students. Upon request, Queens College will provide Queensborough Community College with names and academic status of all recent transfer students from QCC pursuing the abovementioned bachelor's degree program.

Sending and receiving college procedures for publicizing agreement:

Queensborough Community College and Queens College will collaborate in publicizing this agreement on their websites and in their catalogs. They will share brochures and other marketing materials including web-based promotions. Transfer advisors will be made aware of this agreement and will have available all necessary materials to publicize the agreement to the students with whom they work.

Members of the Senior College Enrollment Management Division will have this agreement and attend recruitment events at the Sending Institution. They will be assisted by the Office of Academic Affairs and the Transfer Resource Center at Queensborough Community College.

Additional Information

This agreement is deemed to be consistent with the CUNY Pathways General Education curriculum, and will be updated whenever necessary in keeping with changes in the Pathways curriculum. Queens College requires 6-7 credits of additional Pathways classes as part of the College Option, which includes a literature and a language requirement, as well as two Writing Intensive (W) units, with a minimum of one in residency. Writing Units may overlap with other requirements. According to the specifics in this agreement, students will complete a minimum of 60 credits at each institution; however, students who transfer into Queens with more than 60 credits must complete at least 45 credits at Queens College to earn a Queens College degree.

Effective Date: Fall 2021

For Queensborough Community College: For Queens College:

Timothy G. Lynch Timothy G. Lynch (Sep 9, 2020 17:16 EDT)	Sep 9, 2020	Elizabeth Hendrey Elizabeth Hendrey (Sep 10, 2020 09-42 EDT)	Sep 10, 2020
Timothy Lynch, Ph.D. Provost and Senior Vice-Preside for Academic Affairs	Date ent	Elizabeth Hendrey, Ph.D. Provost and Senior Vice Presid Academic Affairs	Date dent for
Michael Pullin Michael Pullin (Sep 10, 2020 10:29 EDT)	Sep 10, 2020	Alicia M. Alvero (Sep 9, 2020 17:13 EDT)	Sep 9, 2020
Michael Pullin, Ph.D. Associate Dean of Academic Affairs	Date	Alicia Alvero, Ph.D. Associate Provost	Date
David H Ueberman (Sep 9, 2020 13:41 EDT)	Sep 9, 2020	Steven Schwarz (Sep 9, 2020 14:38 EDT)	Sep 9, 2020
David Lieberman, Ph.D. Chair, Department of Physics	Date	Dr. Steven A. Schwarz Chair, Physics Department	Date

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Total transfer credits granted toward the baccalaureate degree: <u>60 credits</u>. Total additional credits required at the Queens College to complete the baccalaureate degree: <u>60 credits</u>

C. Course-to-Course Equivalencies and Transfer Credit Awarded

Course and Title	Queensborough Community College		Queens College		
Common Core Requirements	Course and Title	Credit	Course and Title	Credit	Transfer Credits
Required Core 1A:		Ciedit		Credit	Awarucu
ENGL-101 English Composition 3					
ENGL-102 English Composition 3		3		3	3
Required Core 15:					
MAT-440 Pre-Calculus Mathematics12	Required Core 1B:	_			
Required Core 1C:		4		4	4
PH-121 General Calculus Physics A Flexible Core 2A: Select any courses in 2A Flexible Core 2A: Select any courses in 2B Flexible Core 2C: Select any courses in 2C 3 Creative Expression 3 3 Flexible Core 2C: Select any courses in 2D 3 Individual and Society 3 3 Flexible Core 2C: Select any courses in 2D 3 Individual and Society 3 3 Flexible Core 2C: Select any courses in 2D 3 Individual and Society 3 3 Flexible Core 2E: PH-422 General Calculus Physics B Additional Flexible Core Course: MATH 151 Calculus/Differentiation and Integration Subtotal Flexible Core Course: MATH 151 Calculus/Differentiation and Integration Subtotal Flexible Core Course: MATH 151 Flexible Core Course: MATH 151 Calculus/Differentiation and Integration Subtotal Flexible Core Course: MATH 151 Calculus/Differentiation and Integration Subtotal Flexible Core Course: MATH 151 Calculus/Differentiation and Integration Flexible Core Course: MATH 151 Calculus/Differentiation and Integration Subtotal Flexible Core Course: MATH 151 Calculus/Differentiation and Integration Flexible Core Course: MATH 151 Calculus/Differentiation and Integration Subtotal Flexible Core Course: MATH 151 Calculus/Differentiation and Integration Flexible Core Course: MATH 151 Flexible Core Cours		_			_
Flexible Core 2A: Select any courses in 2A 3 World Cultures and Global Issues 3 3		5	PHYS 145 Principles of Physics I and Lab	5	5
Flexible Core 2C: Select any courses in 2C 3 Creative Expression 3 3 Flexible Core 2D: Select any courses in 2D 3 Individual and Society 3 3 Flexible Core 2E: 5 PHYS 146 Principles of Physics II and Lab 5 5 Flexible Core 2E: 4 Additional Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Calculus/Differentiation and Integration 1 1 Flexible Core Course: MATH 151 4 4 Additional Flexible Core Course: MATH 151 4 4 Flexible Core Course: MATH 151 5 6 Flexible Core Course: MATH 152 6 6 Flexible Core Course: MATH 151 6 6 Flexible Core Course: MATH 151 6 6 Flexible Course Equivalency 4 4 Flective Course: MATH 151 6 6 Flexible Course Equivalency 4 4 Flexible Course Equivalency 5 6 Flexible Course Equ		3	World Cultures and Global Issues	3	3
Flexible Core 2C: Select any courses in 2C 3 Creative Expression 3 3 3 Flexible Core 2D: Select any courses in 2D 3 Individual and Society 3 3 3 Flexible Core 2E: 5 PHYS 146 Principles of Physics II and Lab 5 5 Additional Flexible Core Course: MATH 151 4 4 Calculus/Differentiation and Integration 4 4 Calculus/Differentiation and Integration 5 5 Requirements for the Major 7 PHY3 80 Colloquium 1 1 1 PH-440 Modern Physics 4 4 4 4 MA-442 Analytic Geometry and Calculus II2 4 4 4 4 MA-443 Analytic Geometry and Calculus III 4 MATH 201 Multivariable Calculus 4 4 Major Electives 7 1 1 Take 10 credits from the following list: CH-151 General Chemistry 1 4.5 CHEM 113 General Chemistry 1 and Lab 5 4.5 MA-419 College Algebra 3 MATH 115 College Algebra for Precalculus 3 3 MA-451 Differential Equations 4 MATH 231 Linear Algebra 4 4 PH-240 Computerized Physical Measurement Using Graphical Programming 4 MATH 232 Differential Equations with Numerical Methods 3 3 PH-450 Introduction to Physics Research 4 PHYS 237 Mechanics 4 4 4 PH-416 Intermodynamics 4 PHYS 237 Mechanics 4 4 4 PH-416 Intermodynamics 4 PHYS 237 Mechanics 4 4 4 PH-416 Intermodynamics 4 PHYS 245 Intro. to Scientific Computing 4 3 PH-450 Introduction to Physics Research 2 Elective Credit - 2 Additional Elective Credit - 2 2	Flexible Core 2B: Select any courses in 2B	3	US Experience in Its Diversity	3	3
Flexible Core 2D: Select any courses in 2D 3	·	3	·	3	3
Flexible Core 2E: PH-422 General Calculus Physics B	·		'	-	
PH-422 General Calculus Physics B Additional Flexible Core Course: Additional Flexible Core Course: MAR-441 Analytic Geometry and Calculus I2 Additional Flexible Core Course: MATH 151 Additional Flexible Core Course: MATH 152 Additional Flexible Core Course: MATH 152 Additional Flexible Core Course: MATH 151 Additional Flexible Course Equivalency Additional Flexible Course Equivalency Additional Flexible Course In Fig. 1 Additional Flexible Course In Fig. 2 Additional Flexible Course In Fig. 3 Additional Flexible Course In Fig. 4 Additional Flexible Course In Fig. 5 Additional Flexible Course In Fig. 6 Additional Flexible Course In Fig. 6 Additi	,	3	individual and Society	3	3
Additional Flexible Core Course: MA-41 Analytic Geometry and Calculus 12 Subtotal Requirements for the Major PH-160 Physics Colloquium PH-440 Modern Physics AA-42 Analytic Geometry and Calculus II2 MA-443 Analytic Geometry and Calculus II2 AA-43 Analytic Geometry and Calculus III AA-443 Analytic Geometry and Calculus III ACICULUS ANALY ANALYTIC ANALY		5	PHYS 146 Principles of Physics II and Lab	5	5
Subtotal 36 Requirements for the Major PH-160 Physics Colloquium PH-400 Modern Physics AA-42 Analytic Geometry and Calculus II2 AA-4243 Analytic Geometry and Calculus III AA-443 Analytic Geometry and Calculus III AA-444 Analytic Geometry and Calculus III AA-451 Differential Equations AA-451 Differential Equations AA-451 Differential Equations AA-451 Differential Equations AA-461 Linear Algebra AA-461 Linear Algebra AA-474 Analytic		4	Additional Flexible Core Course: MATH 151		4
PH-160 Physics Colloquium	MA-441 Analytic Geometry and Calculus I ₂	4	Calculus/Differentiation and Integration	4	4
PH-160 Physics Colloquium	Subtotal	36		Subtotal	36
PH-440 Modern Physics	Requirements for the Major		Course Equivalency		
MA-442 Analytic Geometry and Calculus II2 MA-443 Analytic Geometry and Calculus III MA-443 Analytic Geometry and Calculus III One credit in PE-400, PE-500, or DAN-100 series (one credit in PE-400, PE-500, or DAN-100 series) Subtotal Marth 201 Multivariable Calculus Elective Credit Subtotal 14 Course Equivalency Take 10 credits from the following list: CH-151 General Chemistry I CH-152 General Chemistry II A-5 CHEM 113 General Chemistry I and Lab CH-152 General Chemistry II A-5 CHEM 114 General Chemistry II and Lab MA-119 College Algebra: MA-121 Trigonometry: MA-451 Differential Equations MA-451 Differential Equations MA-461 Linear Algebra PH-240 Computerized Physical Measurement Using Graphical Programming PH-414 Analytical Mechanics PH-415 Electricity and Magnetism PH-416 Thermodynamics PH-416 Thermodynamics PH-450 Introduction to Physics Research PH-501 Special Topics Subtotal Macht 102 Subtotal MATH 233 Subtotal MATH 237 Inro. to Scientific Computing A dditional Elective Credit - 2 Additional Elective Credit - 0-1	PH-160 Physics Colloquium	1		1	1
MA-443 Analytic Geometry and Calculus III	PH-440 Modern Physics	4		4	4
MA-443 Analytic Geometry and Calculus III	MA-442 Analytic Geometry and Calculus II ₂	4		4	4
Cone credit in PE-400, PE-500, or DAN-100 series (one credit courses only)					
Subtotal 14 Subtotal 14 Subtotal 14		4	MATH 201 Multivariable Calculus	4	4
Subtotal 14 Major Electives2 Course Equivalency		1	Elective Credit	_	1
Major Electives₂ Course Equivalency Take 10 credits from the following list: CH-151 General Chemistry I 4.5 CHEM 113 General Chemistry I and Lab 5 4.5 CH-152 General Chemistry II 4.5 CHEM 114 General Chemistry II and Lab 5 4.5 MA-119 College Algebra₁ 3 MATH 115 College Algebra for Precalculus 3 3 MA-121 Trigonometry₁ 1 Elective Credit 1 1 MA-451 Differential Equations 4 MATH 223 Differential Equations with Numerical Methods I 3 3 MA-461 Linear Algebra 4 MATH 231 Linear Algebra I 4 4 PH-240 Computerized Physical Measurement Using Graphical Programming 3 Elective Credit - 3 Graphical Programming 3 Elective Credit - 3 3 PH-415 Electricity and Magnetism 4 PHYS 237 Mechanics 4 4 4 PH-450 Introduction to Physics Research 3 Elective Credit - 3 3 PH-501 Special Topics 3 PHYS 275 Intro. to Scientific Computing <	, , , , , , , , , , , , , , , , , , , ,	1/		Subtotal	1.4
Take 10 credits from the following list: CH-151 General Chemistry I 4.5 CHEM 113 General Chemistry I and Lab 5 4.5 CH-152 General Chemistry II 4.5 CHEM 114 General Chemistry II and Lab 5 4.5 MA-119 College Algebra 3 MATH 115 College Algebra for Precalculus 3 3 MA-121 Trigonometry1 1 Elective Credit 1 1 MA-451 Differential Equations 4 MATH 223 Differential Equations with Numerical Methods I 3 3 MA-461 Linear Algebra 4 MATH 231 Linear Algebra I 4 4 PH-240 Computerized Physical Measurement Using Graphical Programming 3 Elective Credit - 3 Graphical Programming 4 PHYS 237 Mechanics 4 4 PH-414 Analytical Mechanics 4 PHYS 237 Mechanics 4 4 PH-416 Thermodynamics 4 PHYS 310 Electromagnetism 1 4 4 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH-501 Special Topics 3 PHYS 275 Intr		17	Course Equivalency	Jubiolai	17
CH-151 General Chemistry I 4.5 CHEM 113 General Chemistry I and Lab 5 4.5 CH-152 General Chemistry II 4.5 CHEM 114 General Chemistry II and Lab 5 4.5 MA-119 College Algebra: 3 MATH 115 College Algebra for Precalculus 3 3 MA-121 Trigonometry: 1 Elective Credit 1 1 MA-451 Differential Equations 4 MATH 223 Differential Equations with Numerical Methods I 3 3 MA-461 Linear Algebra 4 MATH 231 Linear Algebra I 4 4 PH-240 Computerized Physical Measurement Using Graphical Programming 3 Elective Credit - 3 PH-414 Analytical Mechanics 4 PHYS 237 Mechanics 4 4 PH-415 Electricity and Magnetism 4 PHYS 310 Electromagnetism 1 4 4 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH-451 Numerical Methods 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-501 Special Topics 3 PHYS 383 Special Topics 3 3			Course Equivalency		
CH-152 General Chemistry II 4.5 CHEM 114 General Chemistry II and Lab 5 4.5 MA-119 College Algebra1 3 MATH 115 College Algebra for Precalculus 3 3 MA-121 Trigonometry1 1 Elective Credit 1 1 MA-451 Differential Equations 4 MATH 223 Differential Equations with Numerical Methods I 3 3 MA-461 Linear Algebra 4 MATH 231 Linear Algebra I 4 4 PH-240 Computerized Physical Measurement Using Graphical Programming 3 Elective Credit - 3 Graphical Programming 3 Elective Credit - 3 PH-414 Analytical Mechanics 4 PHYS 237 Mechanics 4 4 PH-415 Electricity and Magnetism 4 PHYS 310 Electromagnetism 1 4 4 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH-501 Special Topics 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2		4.5	CHEM 113 General Chemistry Land Lah	5	4.5
MA-119 College Algebra1 3 MATH 115 College Algebra for Precalculus 3 3 MA-121 Trigonometry1 1 Elective Credit 1 1 MA-451 Differential Equations 4 MATH 223 Differential Equations with Numerical Methods I 3 3 MA-461 Linear Algebra 4 MATH 231 Linear Algebra I 4 4 PH-240 Computerized Physical Measurement Using Graphical Programming 3 Elective Credit - 3 PH-414 Analytical Mechanics 4 PHYS 237 Mechanics 4 4 PH-415 Electricity and Magnetism 4 PHYS 310 Electromagnetism 1 4 4 PH-416 Thermodynamics 4 PHYS 242 Thermodynamics 3 3 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH-501 Special Topics 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1					
MA-121 Trigonometry1 1 Elective Credit 1 1 MA-451 Differential Equations 4 MATH 223 Differential Equations with Numerical Methods I 3 3 MA-461 Linear Algebra 4 MATH 231 Linear Algebra I 4 4 PH-240 Computerized Physical Measurement Using Graphical Programming 3 Elective Credit - 3 PH-414 Analytical Mechanics 4 PHYS 237 Mechanics 4 4 PH-415 Electricity and Magnetism 4 PHYS 310 Electromagnetism 1 4 4 PH-416 Thermodynamics 4 PHYS 242 Thermodynamics 3 3 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH-501 Special Topics 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1 - 0-1					
MA-451 Differential Equations 4 MATH 223 Differential Equations with Numerical Methods I 3 3 MA-461 Linear Algebra 4 MATH 231 Linear Algebra I 4 4 PH-240 Computerized Physical Measurement Using Graphical Programming 3 Elective Credit - 3 PH-414 Analytical Mechanics 4 PHYS 237 Mechanics 4 4 PH-415 Electricity and Magnetism 4 PHYS 310 Electromagnetism 1 4 4 PH-416 Thermodynamics 4 PHYS 242 Thermodynamics 3 3 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH 451 Numerical Methods 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-501 Special Topics 3 PHYS 383 Special Topics 3 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1 Additional Elective Credit - 0-1					
MA-461 Linear Algebra 4 Math 231 Linear Algebra I 4 4 PH-240 Computerized Physical Measurement Using Graphical Programming 3 Elective Credit - 3 PH-414 Analytical Mechanics 4 PHYS 237 Mechanics 4 4 PH-415 Electricity and Magnetism 4 PHYS 310 Electromagnetism 1 4 4 PH-416 Thermodynamics 4 PHYS 242 Thermodynamics 3 3 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH 451 Numerical Methods 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-501 Special Topics 3 PHYS 383 Special Topics 3 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1 Additional Elective Credit - 0-1					
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PH-240 Computerized Physical Measurement Using Graphical Programming 3 Elective Credit - 3 PH-414 Analytical Mechanics 4 PHYS 237 Mechanics 4 4 PH-415 Electricity and Magnetism 4 PHYS 310 Electromagnetism 1 4 4 PH-416 Thermodynamics 4 PHYS 242 Thermodynamics 3 3 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH 451 Numerical Methods 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-501 Special Topics 3 PHYS 383 Special Topics 3 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1 Additional Elective Credit - 0-1		4	MATH 231 Linear Algebra I	4	4
Graphical Programming 4 PHYS 237 Mechanics 4 4 PH-414 Analytical Mechanics 4 PHYS 310 Electromagnetism 1 4 4 PH-415 Electricity and Magnetism 4 PHYS 310 Electromagnetism 1 4 4 PH-416 Thermodynamics 4 PHYS 242 Thermodynamics 3 3 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH-510 Special Methods 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-501 Special Topics 3 PHYS 383 Special Topics 3 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1 Subtotal 102 Subtotal 10	PH-240 Computerized Physical Measurement Using	3	Flective Credit	_	3
PH-415 Electricity and Magnetism 4 PHYS 310 Electromagnetism 1 4 4 PH-416 Thermodynamics 4 PHYS 242 Thermodynamics 3 3 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH 451 Numerical Methods 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-501 Special Topics 3 PHYS 383 Special Topics 3 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1 Subtotal 102 Subtotal 10	Graphical Programming				
PH-416 Thermodynamics 4 PHYS 242 Thermodynamics 3 3 PH-450 Introduction to Physics Research 3 Elective Credit - 3 PH 451 Numerical Methods 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-501 Special Topics 3 PHYS 383 Special Topics 3 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1 Subtotal 102 Subtotal 10					
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PH 451 Numerical Methods 3 PHYS 275 Intro. to Scientific Computing 4 3 PH-501 Special Topics 3 PHYS 383 Special Topics 3 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1 Subtotal 102 Subtotal 10			PHYS 242 Thermodynamics		
PH-501 Special Topics 3 PHYS 383 Special Topics 3 3 PH-900 Independent Study Physics Research 2 Elective Credit - 2 Additional Elective Credit - 0-1 Subtotal 102 Subtotal 10	,				
PH-900 Independent Study Physics Research 2 Elective Credit — 2 Additional Elective Credit — 0-1 Subtotal 10₂ Subtotal 10₂				_	
Additional Elective Credit - 0-1 Subtotal 102 Subtotal 10					
Subtotal 10 ₂ Subtotal 10	FIT-900 Independent Study Physics Research			+-	
	Quintotal	100	Additional Elective Credit	Subtotal	
Total 60 I	Total	60		Total	60

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PHYS 222 Optics	3
PHYS 233 Intermediate Methods of Math Physics I	3
PHYS 234 Intermediate Methods of Math Physics II	3
PHYS 235 Classical Physics Laboratory	2
PHYS 237 Mechanics (or PH-414 at QCC)	0-4
PHYS 243 Thermodynamics and Statistical Mechanics	4
PHYS 310 Electromagnetism I (or PH-415 at QCC)	0-4
PHYS 311 Electromagnetism 2	4
PHYS 345 Solid State Physics	4
PHYS 365 Principles of Quantum Mechanics	4
PHYS 377 Modern Physics Laboratory	2
One 3- or 4-credit physics course at the 200 level or above (excluding PHYS 204 and 207).	3-4
One science/mathematics course approved by the department (or CH-151 at QCC)	0-4
Subtotal	38-51
Additional course work to reach 120 credits	9-22
Total credits to be earned at Queens College	60

Note: The above table assumes students completed MA-442, MA-443, and PH-440 at QCC. If those courses were not completed at QCC, then the courses must be completed at Queens College.

E. Summary of credits required

Total credits to be earned at Queensborough Community College	60
Total credits to be earned at Queens College	60
Total credits required for the B.S. degree	120

F. Articulation Agreement Follow-up Procedures

Procedures for reviewing, updating, modifying, or terminating the agreement:

This agreement will be valid for 3 academic years from the Effective Date (below). Each year, there will be a review of the agreement's effectiveness by the Academic Affairs Officers at each institution.

When any of the programs within this agreement undergo any changes relevant to this agreement, this agreement will be reviewed and revised as necessary by the Curriculum Committees of both the sending and receiving program.

Either party may independently cancel this agreement by notifying the other party no less than one academic year before the intended date of cancellation.

Procedures for evaluating agreement:

The academic department, advisement centers, and Offices of Institutional Effectiveness from each campus will keep data on the academic progress of the transfer students. Upon request, Queens College will provide Queensborough Community College with names and academic status of all recent transfer students from QCC pursuing the abovementioned bachelor's degree program.

Sending and receiving college procedures for publicizing agreement:

Queensborough Community College and Queens College will collaborate in publicizing this agreement on their websites and in their catalogs. They will share brochures and other marketing materials including web-based promotions. Transfer advisors will be made aware of this agreement and will have available all necessary materials to publicize the agreement to the students with whom they work.

Members of the Senior College Enrollment Management Division will have this agreement and attend recruitment events at the Sending Institution. They will be assisted by the Office of Academic Affairs and the Transfer Resource Center at Queensborough Community College.

Additional Information

This agreement is deemed to be consistent with the CUNY Pathways General Education curriculum, and will be updated whenever necessary in keeping with changes in the Pathways curriculum. Queens College requires 6-7 credits of additional Pathways classes as part of the College Option, which includes a literature and a language requirement, as well as two Writing Intensive (W) units, with a minimum of one in residency. Writing Units may overlap with other requirements. According to the specifics in this agreement, students will complete a minimum of 60 credits at each institution; however, students who transfer into Queens with more than 60 credits must complete at least 45 credits at Queens College to earn a Queens College degree.

Effective Date: Fall 2021

For Queensborough Community College: For Queens College:

TIMOTHY G. LYNCH Timothy G. Lynch (Sep 9, 2020 17:16 EDT)	Sep 9, 2020	Elizabeth Hendrey Elizabeth Hendrey (Sep 10, 2020 09:42 EDT)	Sep 10, 2020
Timothy Lynch, Ph.D. Provost and Senior Vice-Preside for Academic Affairs	Date ent	Elizabeth Hendrey, Ph.D. Provost and Senior Vice Preside Academic Affairs	Date ent for
<i>Michael Pullin</i> chael Pullin (Sep 10, 2020 10:29 EDT)	Sep 10, 2020	## 1/10 P. Alicia M. Alvero (Sep 9, 2020 17:13 EDT)	Sep 9, 2020
Michael Pullin, Ph.D. Associate Dean of Academic Affairs	Date	Alicia Alvero, Ph.D. Associate Provost	Date
DLH *** wid H Leberman (Sep 9, 2020 13:41 EDT)	Sep 9, 2020	Steven Schwarz (Sep 9, 2020 14:38 EDT)	Sep 9, 2020
David Lieberman, Ph.D. Chair, Department of Physics	Date	Dr. Steven A. Schwarz Chair, Physics Department	Date

QCC Physics to QC Physics Articulation Agreements 2021

Final Audit Report 2020-09-10

Created: 2020-09-03

By: Michael Pullin (mpullin@qcc.cuny.edu)

Status: Signed

Transaction ID: CBJCHBCAABAAsnA2TPTo9jb8Q5bwAV9mEJ0oFRnAgHGh

"QCC Physics to QC Physics Articulation Agreements 2021" His tory

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