



ARTICULATION AGREEMENT

A. SENDING AND RECEIVING INSTITUTIONS

Sending College: Borough of Manhattan Community College

Program: Data Science

Degree: Associate of Science (A.S.)

Receiving College: John Jay College of Criminal Justice

Program: Applied Mathematics: Data Science and Cryptography

Degree: Bachelor of Science (B.S.)

B. ADMISSION REQUIREMENTS FOR SENIOR COLLEGE PROGRAM

- Successful completion of a freshman composition course, its equivalent, or a higher-level English course
- Successful completion of a 3-credit college-level math course
- A.S. Degree in Data Science and a minimum GPA of 2.0

C. SUMMARY OF TRANSFER CREDITS FROM BMCC AND CREDITS TO BE COMPLETED AT JOHN JAY

	Total Credits for Baccalaureate	Transfer Credits from BMCC	Credits to be Completed at John Jay
General Education Requirements	36	30	6
Major Requirements	51	20	31
Electives	33	10	23
Total	120	60	60

Total transfer credits granted toward the baccalaureate degree: 60

Total additional credits required at the senior college to complete baccalaureate degree: 60

Total credits required for the John Jay baccalaureate degree: 120

D. TRANSFER CREDITS AWARDED

Borough of Manhattan Community College (BMCC) graduates who complete the Associate in Science (A.S.) degree in Data Science will receive 60 credits toward the Bachelor of Science degree in Applied Mathematics: Data Science and Cryptography at John Jay College of Criminal Justice (John Jay) as indicated below.

Common Core	
<i>Required Common Core</i>	
English Composition	6
Mathematical and Quantitative Reasoning ¹	3
Life and Physical Sciences	3
<i>Total Required Common Core</i>	12
<i>Flexible Common Core</i> ²	
Creative Expression	3
Individual and Society	3
Scientific World ³	6
U.S. Experience in Its Diversity	3
World Cultures and Global Issues	3
<i>Total Flexible Common Core</i>	18
Total Common Core	30
Major Requirements	
MAT 200 – Introduction to Discrete Mathematics	4
MAT 301 – Analytic Geometry and Calculus I	4
MAT 302 – Analytic Geometry and Calculus II	4
MAT 409 – Probability and Statistics for Data Science	4
MAT 415 – Linear Algebra for Data Science	3
Program Electives – <i>Select nine (9) credits from the following:</i>	
MAT 420 – Introduction to Machine Learning ⁴	
CSC 203 – Python Programming ⁴	
CSC 211 – Advanced Programming Techniques	9
CIS 395 – Database Systems I	
CIS 490 – Introduction to Data Science	
General Electives ⁵	2
<i>Total Major Requirement Credits</i>	30
Total Program Credits	60

¹ Students are required to take MAT 206 or MAT 206.5.

² No more than two courses in any discipline or interdisciplinary field can be used to satisfy the Flexible Common Core requirements.

³ Students are required to take CSC 101 and CSC 111.

⁴ Students must take the MAT 420 and CSC 203 courses in the program electives in order to transfer to John Jay under this agreement.

⁵ The credits can be satisfied by taking STEM variants in the Common Core.

E. REMAINING CREDITS FOR THE BACCALAUREATE DEGREE

Courses	Credits
General Education – College Option Requirements	
One course from 300-level Justice Core	3
One course from Learning from the Past or Communications	3
<i>General Education – College Option Requirements Total</i>	6
Major Requirements	
<i>Part Two: Mathematics Core Courses</i>	
MAT 253 – Calculus III	4
MAT 265 – Elements of Mathematical Proof	3
MAT 302 – Probability and Mathematical Statistics II	3
MAT 341 – Advanced Calculus I	3
MAT 351 – Introduction to Ordinary Differential Equations	3
<i>Part Three: Concentration A: Data Science</i>	
CSCI 362 – Databases and Data Mining	3
MAT 367 – Multivariate Analysis	3
MAT 455 – Data Analysis	3
<i>Part Four: Major Electives</i>	
<i>Choose 1 course from:</i> CSCI 360 – Cryptography and Cryptanalysis CSCI 376 – Artificial Intelligence CSCI 377 – Computer Algorithms CSCI 385 – Faculty Mentored Research Experience in Computer Science CSCI 421 – Quantum Computing MAT 352 – Applied Differential Equations (Partial Differential Equations) MAT 354 – Multiple Regression Analysis MAT 361 – Introduction to Functions of a Complex Variable MAT 365 – The Mathematics of Signal Processing MAT 371 – Numerical Analysis MAT 380 – Selected Topics in Mathematics MAT 385 – Faculty Mentored Research Experience in Mathematics MAT 410 – Abstract Algebra MAT 442 – Advanced Calculus II MAT 460 – Mathematical Cryptography	3
Major Requirement Subtotal	28
Electives	26
Total credits required at John Jay	60
Total credits transferred from BMCC	60
Total credits required for the baccalaureate degree	120

F. COURSE EQUIVALENCIES

BMCC Course	BMCC Course Title	John Jay Course	John Jay Course Title	Credits Awarded
CSC 101	Principles in Information Technology and Computation	CSCI 171	The Nature of Computers and Computing	3
CSC 203	Python Programming	CSCI 172	Introduction to Data Science (Python II)	3
MAT 206.5	Intermediate Algebra and Precalculus	MAT 141	Pre-Calculus	3+1 elective credit
MAT 206	Precalculus			
MAT 301	Analytic Geometry and Calculus I	MAT 151	Calculus I	4
MAT 302	Analytic Geometry and Calculus II	MAT 152	Calculus II	4
MAT 409	Probability and Statistics for Data Science	MAT 301	Probability & Mathematical Statistics I	3
MAT 415	Linear Algebra for Data Science	MAT 310	Linear Algebra	3
MAT 420	Introduction to Machine Learning	CSCI 358	Machine Learning	3

G. ARTICULATION AGREEMENT FOLLOW-UP PROCEDURES

- Procedures for reviewing, updating, modifying or terminating agreement:*
 When either of the degree programs involved in this agreement undergoes a change, the agreement will be reviewed and revised accordingly by faculty from each institution's respective departments, selected by their chairpersons/program directors.
- Procedures for evaluating agreement, i.e., tracking the number of students who transfer under the articulation agreement and their success:*
 On request, John Jay will provide BMCC with the following information: a) the number of BMCC students who applied to the program; b) the number of BMCC students who were accepted into the program; c) the number of BMCC students who enrolled; and d) the aggregate GPA of these enrolled students.
- Sending and receiving college procedures for publicizing agreement, e.g., college catalogs, transfer advisers, websites, etc.:*
 This articulation agreement will be publicized on the BMCC website, and the John Jay website. Transfer advisers at BMCC will promote this agreement with eligible students.

Effective Date: Fall 2023, pending NYSED approval

APPENDIX A: SAMPLE DEGREE MAP

SEMESTER #1	CRS	SEMESTER #2	CRS
MAT 206/206.5 - Intermediate Algebra with Precalulus/Precalculus CSC 101 - Principles of Information Technology and Computation SPE 100 - Introduction to Speech ENG 101 - English Composition XXX xxx - Individual and Society	16	MAT 200 - Introduction to Discrete Mathematics CSC 111 - Introduction to Programming ENG 201 - Introduction to Literature MAT 301 - Analytic Geometry and Calculus I	15
SEMESTER #3	CRS	SEMESTER #4	CRS
MAT 302 - Analytic Geometry and Calculus II MAT 409 - Probability & Statistics for Data Science XXX xxx - Life and Physical Sciences CSC 203 - Python Programming	14	MAT 420 - Introduction to Machine Learning MAT 415 - Linear Algebra for Data Science CIS 490 - Introduction to Data Science XXX xxx - US Experience in Its Diversity XXX xxx - World Cultures and Global Issues	15
SEMESTER #5	CRS	SEMESTER #6	CRS
Communications (College Option Course) CSCI 272 - Object-Oriented Programming MAT 253 - Calculus III MAT 351 – Introduction to Ordinary Differential Equations Elective or Minor	16	300-level Justice Core (College Option Course) MAT 265 – Elements of Mathematical Proof MAT 302 – Probability and Mathematical Statistics II MAT 367 – Multivariate Analysis Elective or Minor	15
SEMESTER #7	CRS	SEMESTER #8	CRS
CSCI 362 – Databases and Data Mining Part Four Major Elective (1 Course) Elective or Minor Elective or Minor Elective or Minor	15	MAT 341 – Advanced Calculus I MAT 455 – Data Analysis Elective or Minor Elective or Minor Elective or Minor	14