Letter of Articulation
between
Brooklyn College
of the
City University of New York
and
Borough of Manhattan Community College
of the
City University of New York

Brooklyn College agrees to accept into the Bachelor of Science degree program in Computer and Information Science students from Borough of Manhattan Community College who successfully complete the Computer Science curriculum described below (see Section B for course equivalencies), thereby receiving an Associate in Science degree. Successful completion of the Computer Science curriculum at Borough of Manhattan Community College includes the attainment of at least a 2.0 overall grade-point average.

Borough of Manhattan Community College and Brooklyn College agree to present the courses noted in the Computer Science curriculum described below as outlined in each of the colleges' catalogs, and agree to notify each other if course numbers, content or catalog descriptions change. Furthermore, the parties involved understand that any change in course number, content or catalog description may require a modification to this agreement.

It is also understood that the Department of Computer Information Systems at Borough of Manhattan Community College will identify Borough of Manhattan Community College students who wish to participate in the articulation, and will recommend the Computer and Information Science program at Brooklyn College to those who successfully complete the Computer Science curriculum.

Provost
Brooklyn College

Vice President for
Academic Affairs
Borough of Manhattan
Community College

Chairperson, Computer and
Information Science
Brooklyn College

Chairperson, Computer
Information Systems
Borough of Manhattan
Community College

Date: 8/17/98

Date: 8/17/98

Borough of Manhattan Community College
The City University of New York

Section A

Computer Science Program
Leading to the Associate in Science (A.S.) degree

General Requirements		Credits
ENG 101	English Composition I	3
ENG 201	English Composition II	3
SPE 100	Fundamentals of Speech (SPE 102 satisfies this requirement for students whose first language is not English)	3
XXX xxx	Music or Art	1
XXX xxx	Social Science (Choose a course in anthropology, economics, geography, history, philosophy, political science, psychology, sociology, or an Ethnic Studies social science course in one of the above categories.	3
Total General Credits		**13**

Curriculum Credits		Credits
CSC 110	Computer Programming I	4
CSC 210	Computer Programming II	4
CSC 230	Discrete Structures	3
CSC 310	Assembler Language and Architecture I	3
CSC 330	Data Structures I	3
CSC 410	Assembler Language and Architecture II	3
CSC 430	Data Structures II	3
MAT 200	Introduction to Discrete Mathematics (Elementary Algebra, MAT 051, and Intermediate Algebra, MAT 056, are pre-requisites for MAT 200.)	4
MAT 301	Analytic Geometry and Calculus I (MAT 206 is a pre-requisite for MAT 301.)	4
MAT 302	Analytic Geometry and Calculus II	4
MAT 303	Analytic Geometry and Calculus III	4
PHY 215	University Physics I	4
PHY 225	University Physics II	4
Total Curriculum Credits		**47**
Total Program Credits		**60**

Computer Science Program at
Borough of Manhattan Community College
Course Equivalency Listing for
Brooklyn College Computer Science Degree

Section B

General Requirements			**General Requirements**		
Course	**Description**	**Crs.**	Course	Description	Crs.
ENG 101	English Composition I	3		Elective	3
ENG 201	English Composition II	3		Elective	3
SPE 100	Fundamentals of Speech	3	SPE 3	Techniques in Speech Communications (fulfills speech requirement)	3
XXX xxx	Music or Art (Art 110, 210, 220, 801 or 802 or Mus 110, 220, 230 or 811)	2 3/4 1	Core Studies 2.1 or 2.2	Introduction to Art Or Introduction to Music	2
XXX xxx	Social Science: HIS 102 or PHI 100	3	Core 4 Core 10	Shaping the Western World (European History 1700-1900) or Knowledge, Existence and Values	3
	Total General Credits	13		Total General Credits	14
Curriculum Requirements			**Curriculum Requirements**		
CSC 110	Computer Programming I	4	CIS 0.1	Computers in our Society	3
CSC 210	Computer Programming II	4	CIS 1.5	Programming in C	4
CSC 230	Discrete Structures	3	CIS 11	Introduction to Discrete Structures	3
CSC 310	Assembler Language & Architecture I	3	CIS 4.1	Assembly Language Programming for Microcomputers	3
CSC 330	Data Structures I	3	CIS 15	Advanced Programming Techniques Using C	3
CSC 410	Assembler Language & Architecture II	3	CIS 27	Computer Organization	3
CSC 430	Data Structures II	3	CIS 22	Data Structures	4
MAT 200	Introduction to Discrete Mathematics	4		Elective	4
MAT 301	Analytic Geometry & Calculus I	4	MATH 3.3	Calculus I	3
MAT 302	Analytic Geometry & Calculus II	4	MATH 4.3	Calculus II	4
MAT 303	Analytic Geometry & Calculus III	4	MATH 5.3	Multivariable Calculus (Elective)	4
PHY 215	University Physics I	4	PHYS I	General Physics (Core 7.1 & 7.2)	4
PHY 225	University Physics II	4	PHYS II	General Physics (Elective)	4
	Total Curriculum Credits	47		**Total Curriculum Credits**	46
	Total Program Credits	60		**Total Program Credits**	60

Upon completion of the Associate in Science degree in Computer Science at Borough of Manhattan Community College, the student entering the Bachelor of Science program in Computer and Information Science at Brooklyn College will complete the following curriculum:

CORE STUDIES COURSES
Core Studies I
Classical Origins of Western Culture 3 hours; 3 credits Introduction to the classical origins of Western civilization through study, in English translation, of Greek and Latin masterpieces that are recognized as landmarks in the evolution of modern thought and as prototypes for the major literary genres. Readings are supplemented by general lectures, films, and slides. (*Not open to students who are enrolled in or have completed Classics 1 or 1.1 or 1.2 or Humanities 10.1.) Core Studies 1 is administered by the Department of Classics.
Core Studies II
Introduction to Art 2 hours; 2 credits Survey of history of Western art from classical times to the present day. ((Not open to students who are enrolled in or have completed Art 1.1 or 1.3. or 2.3. or 2.4.) Core Studies 2.1 is administered by the Department of Art. 2.2 Introduction to Music 2 hours; 2 credits Introduction to music through the study of works representing different times, places, and peoples. Recorded, concert, and classroom performances. (Not open to students who are enrolled in or have completed Music 9.1 or 11.1.)
Core Studies III
People, Power, and Politics 4 hours; 4 credits Introduction to the social sciences through the study of power, authority, and social organization in American society. Emphasis on gaining insight into American society in broad terms, as well as in terms of such specific issues as social class, race, gender, community, equality, and opportunity. The unifying theme of the course is an understanding of the nature of power (social and political). A major goal of the course is an understanding of contemporary issues and controversies involving power in America. Core Studies 3 is administered jointly by the Departments of Political Science and Sociology.

Core Studies IV

The Shaping of the Modern World
3 hours; 3 credits

European and American civilization since 1700 in its global context. Revolution, industrialization, and nationalism as agents of economic, political, social and cultural change. Introduction to historical analysis and argument.

Core Studies 4 is administered by the Department of History.

Core Studies V

Introduction to Mathematical Reasoning and Computer Programming
3 hours; 3 credits

The nature of an algorithm and introduction to programming. Formal mathematical systems and proofs; rudiments of probability theory and of combinatorial analysis, with use of the computer as an aid in solving problems. Other simple computer applications. (Not open to students who are enrolled in or have completed any course in computer and information science or to students who have completed any course in computer and information science or to students who have completed a mathematics course numbered 3.20 or higher with a grade of C or higher.) Prerequisite: a high school course in intermediate algebra or Course 2 of the New York State Sequential Mathematics Curriculum, or Mathematics 0.35 or 0.44 with a grade of at least C, or Mathematics 0.36 or .0.04, or the equivalent.

Core Studies 5 is administered jointly by the Departments of Mathematics and Computer and Information Science

Core Studies VI

Landmarks of Literature
3 hours; 3 credits

Emphasis on English and American literature; works of European and non-Western cultures. Examples drawn from fiction, drama and poetry. (Students whose native language is not English may delay taking this course until after have completed 96 credits.) Prerequisite: English 2 .

Core Studies 6 is administered by the Department of English.

Core Studies VII

7.1 Science in Modern Life: Chemistry
A total of 23 hours lecture and 14 hours laboratory per term; 2 credits
Study of basic concepts in chemistry and their implication in modern life. (Not open to students who are enrolled in or have completed Integrated Science 2 or any college course in chemistry, except chemistry 0.7 or 1.1.) Prerequisite: Mathematics 0.02 or 0.22 or equivalent or a passing grade on the CUNY Mathematics Skills Assessment Test.

7.2 Science in Modern Life: Physics
A Total of 23 hours lecture and 14 hours laboratory per term; 2 credits
Study of basic concepts in physics and their implications in modern life. (Not open to students who are enrolled in or have completed Physics 0.1 or 1 or 1.2 or 1.5 or 1.6 or Integrated Science 1.) Prerequisite: Course 2 of the New York State Sequential Mathematics Curriculum or Mathematics 0.04 or a grade of at least C in Mathematics 0.35 or 0.35 or 0.44, or a passing grade in Core Studies 5, or placement in any Mathematics course numbered 2.9 or higher.

Core Studies is administered jointly by the Departments of Chemistry and Physics.

Core Studies VIII
8.1 Science in Modern Life: Biology A total of 23 hours lecture and 14 hours laboratory per term; 2 credits Study of basic concepts in biology and their implications in modern life. (Not open to students who are enrolled in or have completed Biology 1 or 3.) 8.2 Science in Modern Life: Geology A total of 23 hours lecture and 14 hours laboratory per term; 2 credits Study of basic concepts in geology and their implications in modern life. (Not open to students who are enrolled in or have completed Geology 1.) Core Studies 8 is administered jointly by the Departments of Biology and Geology.
Core Studies IX
Comparative Studies in African, Asian, Latin American, and Pacific Cultures 3 hours; 3 credits A multidisciplinary, team-taught course, with two instructors, interrelating two areas of the world; a comparative geographical overview of the two areas or the world; a comparative geographical overview of the two areas, followed by thematic treatment of each area and comparative analysis. Core Studies 9 is administered by the Core Studies 9 course coordinator under the direction of the Dean of Undergraduate Studies.
Core Studies X
Knowledge, Existence, and Values 3 hours; 3 credits Philosophy's distinctive ways of understanding and thinking about perennial human questions: "What can I know?"; "What is real?"; "What should my values be?" Contemporary and traditional examples of philosophic analysis and criticism. (Not open to students who are enrolled in or have completed Philosophy 1.1.) Core Studies is administered by the Department of Philosophy.

*Any CIS or CSC course and a mathematics course with intermediate algebra (e.g., MAT 200 or above) will satisfy the Core 5 requirement.

Foreign Language Requirement
As part of the core curriculum, all baccalaureate students are required to complete one course in a foreign language at Level 3 (the third semester of study at the college level) or to demonstrate an equivalent proficiency by examination, except as modified below. 1. Students who have successfully completed three years of one language in high school and have passed the Regents Level 3 are exempted from the core language requirement. 2. The foreign language requirement presupposes two years of secondary school language study. Students who offer only one year of foreign language study (or none at all) are required to take one or two semesters of college study (Levels 1 and/or 2) before they can take Level 3. A student who has studied a language in high school for a least two years and wants to study a different language at the college level may do so, but this student must complete a minimum of two terms of the new language at the college level to fulfill the core requirement. 3. Students whose native language is not English may be exempted from this requirement by passing one of the competency examinations administered by the Department of Modern Languages and Literatures. 4. Neither blanket nor equivalent credits will be given for introductory courses in a foreign language from which a student has been exempted by examination.
Computer and Information Science
Core Curriculum
The Department of Computer and Information Science participates in the college's core curriculum through Core Studies 5.
B.S. degree program in computer and information science HEGIS code 0701

Departments Requirements (42-50 credits)

To enroll in any advance course in computer and information science, students must earn a grade of C or higher in all course prerequisites. A student excused, without credit, from a course may not take the course for credit later, except with permission of the chairperson.

Computer and Information Science 1.10 or 1.20 or 2.40.

All of the following: Computer and Information Science 2.10, 11, 15, 22, 44.

One of the following options:

a) Software Option: Computer and Information Science 4 or 4.1; 24; 27 or 28; 25 or 29; 23 or 38; 60.1.

b) Computer Engineering Option: Physics 2.3; Computer and Information Science 2.90 or 4.1; 25; 28; 40 or 42; 23 or 24 or 38.

Mathematics 3.3, 4.3, and 8.1.

Transfer students who receive credit for Mathematics 3.20 and 4.20 are required to take Mathematics 4.31 and 8.1 to satisfy the mathematics requirements for the B.S. degree in computer and information science.

Additional Requirements for a B.S. degree

Candidates for a B.S. degree with a major in computer and information science (including computational mathematics) must complete at least 60 credits in science and mathematics; 24 of these 60 credits must be completed in advanced courses in the major department or departments. These 24 credits must be completed at Brooklyn College with a grade of C or higher in each course.

The following courses may be applied toward the 60 credits in science and mathematics:

A) All courses in the departments of biology, chemistry, computer and information science, geology, mathematics, physics, and psychology.
B) Courses marked with a (•) symbol in the Department of Health and Nutrition Sciences.
C) Anthropology and Archaeology 2.4, 16 24.1, 26.1, 26.2, 36, 85.3.
Core Studies 5, 7.1, 7.2, 8.1, 8.2
Economics 30.2, 20.3, 31.1, 31.2.
Philosophy 13, 33, 42.
Physical Education 22.71, 22.75, 23, 30, 51.
Sociology 77.1

Note: Students transferring from BMCC with an A.S. in Computer Science need to take the following additional courses to meet the Brooklyn College Computer and Information major requirements:

Course	Description	Crs.
CIS 25	Operating Systems	3
CIS 23	Analysis of Algorithms	3
or		
CIS 38	Theoretical Computer Science	3
CIS 60.1	Projects I	3
	One course chosen from:	
CIS 2.10	PL/I	
CIS 2.20	FORTRAN	
CIS 2.30	COBOL	
CIS 2.40	Pascal	
CIS 2.50	UNIX Shell	
CIS 2.70	Java, Proposed	
CIS 2.85	C++	2-3
	Two courses chosen from:	
CIS 13.2	Advanced Personal Computer Technique for Business Application	3
CIS 23	Analysis of Algorithms (If the student has chosen CIS 38 above)	3
CIS 24	Programming Languages	4
CIS 29	Compiler Construction	3
CIS 32	Artificial Intelligence	3
CIS 38	Theoretical Computer Science (If the student has chosen CIS 23 above)	3
CIS 40	Microcomputer Systems Programming	3
CIS 41	Computer Graphics	3
CIS 42	Microprocessors	3
CIS 43	Real-Time Systems	3
CIS 44	File Processing	3
CIS 45	Information Organization and Retrieval	3
CIS 46	Workstation Programming	3
CIS 46.5	Distributed Systems Administration	3
CIS 48	Introduction to Modeling and Simulation	3
CIS 49	Computer Networks and Protocols	3
CIS 51	Decision Support Software	3
CIS 52	Multimedia Computing	3
CIS 55	Parallel and Distributed Computing	3
CIS 70.1	Special Topics in Computer Science	3
Math 4.31	Infinite Series	1
Math 8.1	Probability and Statistics	3