BOROUGH OF MANHATTAN COMMUNITY COLLEGE
The City University of New York
Department of Science

Title of Course COMPUTER METHODS IN SCIENCE	**Class hours 3**
SCI 120 Section _____	**Lab hours 2**
	Instructor
Credits 4	**Information**
	Name:
	Office:
	Room:
	Email:

Course Description
This course teaches a programming and emphasizes application of programming methods for the sciences and engineering.
Numerical methods will be applied to examples gleaned from physics, chemistry and biology and engineering.

Prerequisites/Co-requisites
MAT 206

Student Learning Outcomes
1. Students will be able to acquaint the capabilities of computers and the types of problems that computers can solve.
2. Students will be able to learn the fundamentals of programming so that they can use the computer to solve problems that are encountered in both academic and nonacademic environments.
3. Students will be able to establish good problem-solving techniques that can applied to any problem, whether computer related or not.
4. Students will be able to use practical, real-word engineering and science problems while accomplishing the first three objectives.

Required Text & Readings
Author: Tony Gaddis
Title: *Brief Edition of Starting Out with C++, 4th Edition*
Publisher: Scott Jones Inc.
(BMCC Library Call #:)

Other Resources

Use of Technology (if applicable)

Evaluation & Requirements of Students
Written Examination   50%
Programming Projects (10-12)   50%

Outline of Topics

WEEK	TOPIC	CHAPTER (S)
1	Introduction to computer architecture and languages; Flowcharting fundamentals; IPO Input, Processing, Output) sequence	1, 2
2	Linear programs; Variable, Arithmetic operations; Math functions, and Input/Output	2, 3
3	File handling, keyboard input; Relational operators; Simple IF and IF-ELSE structure	3, 4
4	Looping structures (simple, nested)	5
5	Switch statement; Functions	6
6	Functions	6
7	Applications; Method of Least Squares; Numerical Integration, File Operations	6, 11
8	Numeric Arrays; Random Numbers	7
9	Multidimensional Arrays	7
10	Matrix Manipulations (Addition, Multiplication); Gaussian Elimination, Sorting; Monte Carlo Method	7
11	Pointers	8
12	Characters, Strings, and the string Class	9
13	Structured Data	10
14	Introduction to Classes	12
15	Final Examination	

Class Participation
Participation in the academic activity of each course is a significant component of the learning process and plays a major role in determining overall student academic achievement. Academic activities may include, but are not limited to, attending class, submitting assignments, engaging in in-class or online activities, taking exams, and/or participating in group work. Each instructor has the right to establish their own class participation policy, and it is each student's responsibility to be familiar with and follow the participation policies for each course.

BMCC is committed to the health and well-being of all students. It is common for everyone to seek assistance at some point in their life, and there are free and confidential services on campus that can help.

Single Stop www.bmcc.cuny.edu/singlestop, room S230, 212-220-8195. If you are having problems with food or housing insecurity, finances, health insurance or anything else that might get in the way of your studies at BMCC, come by the Single Stop Office for advice and assistance. Assistance is also available through the Office of Student Affairs, S350, 212-220-8130.

Counseling Center www.bmcc.cuny.edu/counseling, room S343, 212-220-8140. Counselors assist students in addressing psychological and adjustment issues (i.e., depression, anxiety, and relationships) and can help with stress, time management and more. Counselors are available for walk-in visits.

Office of Compliance and Diversity www.bmcc cuny.edu/aac, room S701, 212-220-1236. BMCC is committed to promoting a diverse and inclusive learning environment free of unlawful discrimination/harassment, including sexual harassment, where all students are treated fairly. For information about BMCC's policies and resources, or to request additional assistance in this area, please visit or call the office, or email olevy@bmcc.cuny.edu, or twade@bmcc.cuny.edu. If you need immediate assistance, please contact BMCC Public safety at 212-220-8080.

Office of Accessibility www.bmcc.cuny.edu/accessibility, room N360 (accessible entrance: 77 Harrison Street), 212-220-8180. This office collaborates with students who have documented disabilities, to coordinate support services, reasonable accommodations, and programs that enable equal access to education and college life. To request an accommodation due to a documented disability, please visit or call the office.

BMCC Policy on Plagiarism and Academic Integrity Statement
Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's Web site, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).