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

Title of Course COMPUTER METHODS IN SCIENCE
SCI 120 Section __________

Credits 4

Class hours 3
Lab hours 2

Instructor 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

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<th>WEEK</th>
<th>TOPIC</th>
<th>CHAPTER (S)</th>
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<td>1</td>
<td>Introduction to computer architecture and languages;</td>
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<td>Flowcharting fundamentals; IPO Input, Processing, Output) sequence</td>
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<td>2</td>
<td>Linear programs; Variable, Arithmetic operations;</td>
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<td>Math functions, and Input/Output</td>
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<td>3</td>
<td>File handling, keyboard input; Relational operators;</td>
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<td>Simple IF and IF-ELSE structure</td>
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<td>4</td>
<td>Looping structures (simple, nested)</td>
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<td>5</td>
<td>Switch statement; Functions</td>
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<td>6</td>
<td>Functions</td>
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<td>7</td>
<td>Applications; Method of Least Squares;</td>
<td>6, 11</td>
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<td>Numerical Integration, File Operations</td>
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<td>8</td>
<td>Numeric Arrays; Random Numbers</td>
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<td>Multidimensional Arrays</td>
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<td>10</td>
<td>Matrix Manipulations (Addition, Multiplication);</td>
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<td>Gaussian Elimination, Sorting; Monte Carlo Method</td>
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<td>Pointers</td>
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<td>Characters, Strings, and the string Class</td>
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<td>Structured Data</td>
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<td>Introduction to Classes</td>
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<td>Final Examination</td>
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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 Mask Mandate Policy for In-Person Classes
CUNY has put in place a temporary mask mandate policy that requires the wearing of masks indoors in all campus buildings. See: https://www.cuny.edu/coronavirus/university-updates/clarity-new-mask/

Face masks help prevent the spread of COVID-19. As it is possible to have or carry the coronavirus without having or showing symptoms, it is necessary for every person in our community to wear a mask even if you are fully vaccinated and/or have tested negative for COVID19, or think you are completely healthy. For appropriate/acceptable masks and guidelines on use, see CDC guidelines at: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html.

While the mask mandate is in effect, the following will apply to all in-person classes (including in-person classes associated with hybrid courses):

- In a classroom, if a fully vaccinated instructor is teaching a class and can maintain social distance from all others in the classroom, he/she may choose not to wear a mask (subject to any additional Department guidelines regarding the use of face shields or other layers of protection).
- Students who attempt to enter a classroom without wearing masks will be asked by the instructor to put on their masks before entering. Students who remove their masks during a class session will be asked by the instructor to put on their masks. Masks will be available for distribution for those who need one.
- Students may remove their masks momentarily during class (to drink something quickly), in classrooms other than labs, but must replace their masks immediately after that. The consumption of food is not permitted in any classroom or lab.
- Students who are not fully vaccinated are also required to maintain social distancing between themselves and all others in a classroom.

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).

FREE BMCC STUDENT SUPPORT SERVICES
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.

Advocacy and Resource Center (ARC)  https://www.bmcc.cuny.edu/student-affairs/arc/  room S230, 212-220-8195, arc@bmcc.cuny.edu. 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, contact the Advocacy and Resource Center (formerly Single Stop) for assistance. Please contact us at arc@bmcc.cuny.edu, call 212-220-8195, or come by the office at room S230. You may also contact the Office of Student Affairs, S350, 212-220-8130, studentaffairs@bmcc.cuny.edu, for assistance.

Counseling Center  www.bmcc.cuny.edu/counseling, room S343, 212-220-8140, counselingcenter@bmcc.cuny.edu. 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  https://www.bmcc.cuny.edu/about-bmcc/compliance-diversity, 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, Students who need academic accommodations in connection with a disability must initiate the request with BMCC’s Office of Accessibility (OA). Students need to register with the Office of Accessibility in order to officially disclose their disability status to the College and to determine eligibility for appropriate reasonable accommodations (including any prior IEPs or 504s). Please contact the OA at the start of the semester (or as soon as possible) to coordinate any accommodation request/s: www.bmcc.cuny.edu/accessibility, Room N360 (accessible entrance: 77 Harrison Street), 212-220-8180, accessibility@bmcc.cuny.edu.