

**BOROUGH OF MANHATTAN COMMUNITY COLLEGE**

City University of New York

**Department of Computer Information Systems  
Office S150/Phone: 212-220-1476**

**Assembler Language and Architecture I  
CSC 310  
Spring 2012  
Credits: 3**

**Class hours: 2  
Lab hours: 2**

**Course Description:**

This course is designed to provide a basic knowledge of Computer Architecture and Assembler Language Programming with the emphasis on the following areas: main storage organization; instruction sets and addressing; index and displacement registers, interrupts and the program status word.

**Prerequisites:** Basic skills- ENG 095; ESL 095; ACR 095; MAT 056; CSC 210 (Computer Programming I) or Departmental approval

**Learning Outcomes and Assessment**

After completing this course, students will be able to:

- **Outcome:** understand computer architecture fundamentals and the basic computer components.  
**Assessment:** exam questions
- **Outcome:** implement and develop assembly programs  
**Assessment:** Programming projects and lab exercises, exam questions
- **Outcome:** convert basic high-level programs to low-level programs  
**Assessment:** Lab exercises, exam questions
- **Outcome:** understand interrupts and low-level program tracing  
**Assessment:** Programming projects and exam questions

**General Education Outcomes and Assessment**

- **Quantitative Skills** – Students will use quantitative skills and concepts and methods of programming logic to solve problems  
**Assessment:** Use programming logic and knowledge to solve problems in programming assignments
- **Information and Technology Literacy** – Students will collect, evaluate and interpret information and effectively use information technologies  
**Assessment:** Use an assembly computer programming language to create small-scale application software

**Required Text & Readings:**

Textbook: **Principles of Computer Organization and Assembly Language: Using Java Virtual Machine**  
Author: **Juolo, Patrick**  
Publisher: **Pearson Prentice Hall**  
ISBN: **0-13-148683-7**  
ISBN-13: **9780131486836**

**Other Resources:** Flash drives are recommended.

**Use of Technology (if applicable):**

**Evaluation & Requirements of Students:**

Test(s)/Project	90%
Homework/Evaluation	10%
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	100%

### Outline of Topics:

1. Computer Data Representation
  - a. Binary Numbers
  - b. Hexadecimal Numbers
  - c. ASCII/EBCDIC/Unicode (optional)
2. Conversion/Addition & Subtraction
  - a. Binary/Hexadecimal/Decimal Conversion
  - b. Binary/Hexadecimal Addition/Subtraction
3. Microprocessor Basic Components
  - a. Registers/PSW
  - b. Control Unit (CU)
  - c. Arithmetic Logic Unit (ALU)
  - d. Instruction Cycle
4. CPU Register Arithmetic
  - a. 8-,16-,32-bit Number Addition/Subtraction
  - b. Flags Register and Error detection
5. Memory Addressing
  - a. RAM
  - b. 8/16/32 -bit Memory Addressing
  - c. Index/Displacement Registers
6. Assembly Language Fundamentals
  - a. Data Movement Instructions
    1. MOV
    2. XCHG
  - b. Basic Arithmetic Instructions
    1. ADD/SUB/INC/DEC
    2. MUL/DIV
  - c. Branching Commands
    1. Unconditional Jump(JMP)
    2. Conditional Jumps/CMP
7. Assembly Stack
  - a. Push/Pop Instructions
  - b. Stack Pointer/Stack Segment Register
8. Assembly Procedures
  - a. call/ret instructions
  - b. Register Parameters
  - c. Stack Parameters
9. Interrupts
  - a. Software Interrupts
  - b. Hardware Interrupts

### College Attendance Policy:

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For example, you may be enrolled in a three-hour class. In that class, you would be allowed 4 hours of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

### Academic Adjustments for Students with Disabilities:

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities. BMCC is committed to providing equal access to all programs and curricula to all students.

### 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 side, [www.bmcc.cuny.edu](http://www.bmcc.cuny.edu). For further information on integrity and behavior, please consult the college bulletin (also available online).