

**LAGUARDIA COMMUNITY COLLEGE
CITY UNIVERSITY OF NEW YORK
DEPARTMENT OF MATHEMATICS, ENGINEERING, and COMPUTER SCIENCE**

MAC101 Introduction to Computer Science

4 hours (3 lecture, 1 lab), 3 credits

Prerequisites: CSE099 and MAT200

Pre/Co-requisites: ENG/ESA099/ENC101, ENA099

Catalog Description:

In this first course in the computer science program, emphasis will be placed on algorithmic design. Basic concepts such as selection statements, loops, character strings, arrays, pointers and file processing will be taught. Students will be required to write several programs in an appropriate language.

Instructional Objectives:

1. Introduce students to the technical vocabulary of computer science.
2. Enable students to design programs (algorithms) to solve computer science problems.
3. Familiarize students with number systems and the representation of data in computer memory.
4. Familiarize students with basic control structures such as iteration, sequence and selection.
5. Introduce the concept of recursion.
6. Familiarize students with basic sorting algorithms.
7. Introduce students to array and string data structures.

Performance Objectives:

1. Use appropriate technical vocabulary in writing assignments and projects.
2. Design programs (algorithms) to solve problems.
3. Convert numbers from one base to another and describe computer memory structures.
4. Write programs using the basic control structures of iteration, sequence and selection.
5. Utilize recursive methods in solving problems.
6. Code basic sorting algorithms in an appropriate higher-level language.
7. Use data structures such as arrays and strings.

Textbook:

Brian Overland, **C++ without Fear: A Beginner's Guide that Makes You Feel Smart, 2nd edition**,
Prentice Hall, May 2011, ISBN: 9780132673266

Grading Standards:

Research Paper	10%
HW/Quizzes	10%
Laboratory	20%
Midterm Exams (2@15%)	30%
Final Exam	30%
Total	100%

Note: Your labs will be graded according the following rubric:

1	2	3	4	5
The student has entered a code that does not solve the problem and may or may not run. The code has no relation at all to the solution of the problem.	The program has a sense of the solution but is lacking some key logic.	The structure of the program is good but there is one small logic or syntax error.	The program solves the problem but it is not documented and written concisely and lacks good programming style.	The program solves the problem correctly, is documented, and tested for all cases.

Academic Integrity:

This class will be conducted in compliance with LaGuardia Community College's academic integrity policy.

Attendance:

The maximum number of unexcused absences allowed is 15% of the total class meetings (about 7 hours). Unexcused absences beyond this maximum will result in a grade of WU or F.

Comments:

The grading standards listed above and the suggested homework problems listed in the course outline are both subject to modification by the instructor.

COURSE OUTLINE

Weeks	Topic	Chapter	Suggested Homework
Week 1	Computer use. Introduction to C++ and visual C++. Inputs and Outputs	Chapter 1	# 1.1.1 – 1.1.3 (p.15), # 1.2.1 – 1.2.3 (p.18)
Week 2	Data types, Variables, and Assignments	Chapter 1	# 1.3.1 – 1.3.4 (p.28), # 1.3.5 (p.29)
Week 3	Selection Statements <i>if-else</i>	Chapter 2	# 2.1.1 (p.42), # 2.3.1 (p.56)
Week 4	Repetition, <i>While</i> and <i>for</i> loops	Chapter 3	# 2.2.1 – 2.2.4 (p.49-50), # 3.1.1 – 3.1.2 (p.73)
Week 5	Decisions and Loops. Exam #1	Chapter 3	# 2.4.1 (p.60), # 2.5.1 – 2.5.3 (p.63-64), # 3.1.3 (p.74), # 3.2.1 (p.79)
Week 6	Functions and parameters	Chapter 4	# 4.1.1 – 4.1.2 (p.90), # 4.2.1 – 4.2.4 (p.93), # 4.3.1 – 4.3.3 (p.101)
Week 7	Scope of a variable, Passing parameters by value <i>vs.</i> by reference	Chapter 4	# 4.4.1 – 4.4.2 (p.105), # 4.5.1 – 4.5.2 (p.110), # 4.6.1 – 4.6.2 (p.113)
Week 8	Arrays	Chapter 5	# 5.1.1 – 5.1.3 (p.122-123), # 5.2.1 – 5.2.3 (p.127-128), # 5.3.1 (p.132), # 5.4.1 (p.135), # 5.5.1 (p.141)
Week 9	Introduction to pointers, Pointers <i>vs.</i> references. Exam #2	Chapter 6	# 6.2.1 – 6.2.2 (p.154), # 6.3.1 – 6.3.2 (p.161), # 6.4.1 – 6.4.2 (p.167)
Week 10	Strings and other data structures	Chapter 7	# 7.1.1 – 7.1.2 (p.176-177), # 7.2.1 (p.183), # 7.3.1 – 7.3.2 (p.185), # 7.4.1 – 7.4.3 (p.188), # 7.5.1 – 7.5.2 (p.193)
Week 11	File processing Elementary sorting algorithms	Chapter 8	# 8.1.1 – 8.1.2 (p.203), # 8.2.1 – 8.2.2 (p.205-206), # 8.3.1 – 8.3.2 (p.214), # 8.4.1 – 8.4.3 (p.217)
Week 12	Sorting algorithms Final Exam Review		
Week 13	Final Exam	Covers chapters 1-8	