

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

MAC100 Computing Fundamentals
3 hours lecture, 3 credits

Pre-/Co-requisites

CSE099, ENA/ENG/ESA099/ENC101, MAT096

Catalog Description:

This course introduces students from any non-CS major to the fundamental concepts of computing, technical innovations, and social issues that are at the heart of computer-based technologies. Students are introduced to the myriad uses of the Internet, cloud services, social media, other computer applications designed to connect physical and digital worlds.

Instructional Objectives:

1. Introduce students to principles of computing that are at the heart of the computer science.
2. Provide students with mindset of computational thinking in problem analysis and solution development in scientific world.
3. Reinforce students' ability to apply computing tools to analyze problems and develop solutions.
4. Familiarize students with the binary data format, and boolean expressions used to represent logical relations in decision making process.
5. Describe data storage, processing, and visualization procedures in computer systems.
6. Demonstrate the basic methodology of algorithm design to process input data, and to output problem solution.
7. Explain the use of a general-purpose programming language Python that allows for algorithms to be executed on the computer.
8. Enable the students to identify a computing problem in their own disciplines, and to solve the problem using the knowledge and skills studied in this course.

Performance Objectives:

1. Gather, interpret and assess information about computing in modern society.
2. Articulate and evaluate the impact of computing technologies and scientific discoveries on the contemporary world.
3. Demonstrate how to use computing tools to analyze problems and develop solutions.
4. Identify and apply the fundamental concepts and methods in computer science exploring the scientific world.
5. Understand the scientific principles underlying matters of public concern in which computer science plays a role.
6. Apply computational thinking to articulate and evaluate the empirical evidence supporting a scientific theory.
7. Evaluate evidence and arguments critically with computer technology.

8. Identify and analyze the computing problem in the field of interest, and produce well-reasoned written and oral arguments using evidence to support conclusions.

Textbook:

Fluency With Information Technology: Skills, Concepts, and Capabilities, Lawrence Snyder, 5th edition, Pearson, 2013, ISBN 0132828936.

Grading Standards:

- Homework (4 @ 5% each), 20%
- Computer Assignments (4 @ 5%), 20%
- Tests (2 @ 15%), 30%
- Project, 30%

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 contents listed in the course outline are both subject to modification by the instructor.

COURSE OUTLINE

Week	Topic	Assignment
Week 1	Introduction to computing and information technologies (computer operations, human-computer interaction, networking, cloud services, operating system, script, HTML, etc.)	
Week 2	Privacy and security issues in digital society, ethics and globalization	HW1: Investigation of a security problem in computing, resulting in 2 page paper exploring pros and cons of issue.
Week 3	Data storage, processing, and visualization on computer systems	
Week 4	Applying computing tools to data processing on computer systems Test#1	Computer Assignment #1: Exercise on applying computing tools to data processing on computer systems.
Week 5	Binary data format and boolean expressions used to represent logical relations for decision making	HW2: Understanding computer science principles underlying matters of public concern through documented computing experiment and result interpretation.
Week 6	Problem analysis and abstraction, basic components of algorithm, data input and output	Computer Assignment #2: Exercise on evaluating evidence and arguments critically.

Week 7	Flowcharts and pseudo-code used for algorithm description	HW3: Applying computer science concepts and methods in problem solving, with algorithm described in flowchart or pseudo-code.
Week 8	Online research, discussion on computing problems in field of interest, course project beginning	Course Project: Analyzing and solving computing problem in discipline, project implementation reported in well-reasoned written and oral presentation using evidence to support conclusions
Week 9	Impact of computing technologies and scientific discoveries on the contemporary world Test#2	Computer Assignment #3: Exercise on articulating and evaluating the impact of computing technologies and scientific discoveries on the contemporary world
Week 10	Programming languages and development environments, discussion on course project	Computer Assignment #4: Exercise on articulating and evaluating the empirical evidence supporting a scientific theory.
Week 11	Introduction to programming basics, math expression, conditional statement, selection statements, iteration	HW4: Using computing tools in problem analysis and solution development, detailed in lab report including program design and experiment procedure.
Week 12	Large scale algorithmic program solutions, program execution, debugging and testing	
Week 13	Presentation of projects	Project report