

**Courant Institute of Mathematical Sciences
Computer Science Department
CSCI-UA.0101 Introduction to Computer Science**



2023 Spring Syllabus and Schedule

Please note that this schedule is subject to change at any time without notice by the instructor. If a change occurs, a new version will be uploaded on NYU Brightspace.

Course Number

CSCI-UA.0101

Course Title

Introduction to Computer Science

Section

003

Course Type

In-person

Semester

Spring 2023

Course Description

This course will teach students to solve problems by designing algorithms and building them into standalone computer applications. Experience will be acquired through the completion of projects in a high-level programming language. This course is intended for computer science majors but is suitable for students of other scientific disciplines.

In this class you will be introduced to the field of computer science. Specifically, you will learn how to design and write computer programs in the Java programming language. You will learn the object-oriented paradigm (OOP) and how to model and solve problems using OOP.

You will learn how to apply principles from the fundamentals of computer science using algorithms, data structures, the theory of computing, and the object-oriented paradigm to solve real world problems. You will learn how to decompose a large problem into modules and apply the concepts learned in class to solve programming assignments.

You will convey technical knowledge in a clear and concise manner by presenting your work in class to develop skills in oral and written communication.

Using the basics of the Object-Oriented Paradigm you will learn how it can be used to model a real-life project such as a Point of Sale application, a calculator or phone book application. You will be exposed to solving software problems using application programming interfaces (API) in Java. You will also be exposed to the fundamentals of processing in Java.

Pre-requisites

CSCI.UA.002

Students with extensive programming experience would need to take a test-out exam to take CSCI.UA.0102

Familiarity with basic concepts of programming in some programming language is required (variables, expressions, assignment statements, control statements and basic input output).

Instructor

Gizem Kayar, Ph.D.

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Office: WH 322

Office Hours:

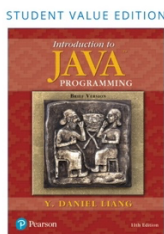
We will start office hours on the week of the 30th of January 2023.

You are highly encouraged to visit the instructor during office hours without notice. Prepare for office hours by coming up with focused and targeted questions. In case there is a line of students waiting, the instructor will limit the meeting to a maximum of 5 minutes per student. You are also encouraged to meet with tutors. The schedule of the tutors will be uploaded on Brightspace and I will be sending emails about the schedule, separately.

Textbook

Introduction to Java Programming, Brief Version by D. Liang; 11th Ed.

ISBN-10: 0-13-359220-0, ISBN-13: 978-0-13-359220-7



Topics

The course consists of two main parts:

Please make sure that you follow the book's chapters according to the chapters we covered class. It is your responsibility to keep up with the readings depending on the chapter we are covering in class. For instance, if we are covering object-oriented programming, you will need to search in the book for the corresponding chapter and read it.

Part 1: Fundamentals of Java Programming

Introduction to computer Science, computer programming and Java
Introduction to Integrated Development Environment: Eclipse
Strings, words and numbers in Java
Primitive data types and expression in Java
Conditional Statements
Iterative Statements
Methods
Arrays and Two-dimensional arrays

Part 2: Object Oriented Programming and Design

Introduction to the object oriented programming paradigm: Objects and Classes
Advanced Object Oriented Programming Features
Inheritance and Polymorphism
Graphics and Animations (using Processing)
Exception Handling and Text I/O
Abstract Classes and Interfaces
Recursion (if time permits)
Introduction to sorting algorithms
ArrayLists in Java

Assignments

The assignments will be sent out via the Brightspace.

HW Submission: You will be asked to send your assignments via Brightspace. While you send your files (source codes, zip files, etc.), please use appropriate file names. For every 24 hours that an assignment is late, we will apply a 10% penalty on the grade, up to a maximum penalty of 30%. After 72 hours, we will no longer accept the assignment.

Tutoring

Tutoring is available but the schedule is TBD and will be shared with you once available.

Grading

Please note that this grading policy is subject to change at any time without notice. If a change occurs, a new version will be uploaded on NYU Classes.

Final grades for the course will be determined using the following weights:

30% Programming assignments
20% First Midterm Exam
20% Second Midterm Exam
24% Final Exam
6% Quizzes

There will be no make-up exam unless you have a documented valid excuse (e.g. major documented illness.) In that case the instructor might offer other options including an oral live exam with the instructor via Zoom.

The following scale will be followed when assigning the final grade: The scale is subject to change accordingly by the instructor at any time during the semester.

A	96-100
A-	90-95
B+	87-90
B	84-87
B-	80-84
C+	76-80
C	72-76
D	65-72
F	less than 65

Students' Requirements

Basic requirements for an effective computer science class include **reading chapters** prior to the lecture. You should be proactive and look for the corresponding chapters of the topics we are covering in class.

You will need to **attend every class**. You will be asked randomly to answer questions and solve problems on your computer where you will demonstrate your solution to the whole class. You will be required to complete the in-class practice and spend a substantial amount of time in doing your homework and the programming assignments.

Cheating Policy

Please check the department's Academic Integrity Policy.

<https://cs.nyu.edu/home/undergrad/policy.html>

Date	Class	Materials Covered	Notes
01/24	#1	basic computer concepts	
01/26	#2	command line, text editors, getting familiar with Java data types, primitives, variables, constants, operators	
02/31	#3	increment and decrement operators, expressions, I/O	
02/02	#4	booleans, conditionals, Math.random, mathematical functions	Assignment 1 given
02/07	#5	char and string	
02/29	#6	loops	Quiz 1
02/14	#7	methods	
02/16	#8	arrays	
02/21	#9	2D Arrays	Assignment 2 given
02/23	#10	review	
02/28	#11	Midterm I	
03/02	#12	Binary search	
03/07	#13	Selection sort	
03/09	#14	Classes, objects	
03/14		SPRING BREAK	Assignment 3 given
03/16		SPRING BREAK	
03/21	#15	Object Oriented Thinking	Quiz 2
03/23	#16	Inheritance and polymorphism	
03/28	#17	Equals, ArrayList	
03/30	#18	Abstract classes, Interfaces	
04/04	#19	Review	
04/06	#20	Midterm II	Assignment 4 given
04/11	#21	Midterm discussion	
04/13	#22	Exceptions	
04/18	#23	File I/O	Quiz 3
04/20	#24	Recursion	
04/25	#25	Processing	
04/27	#26	Processing	Assignment 5 given
05/02	#27	Processing	
05/04	#28	Review	