

## CSCI 13500 ANALYSIS & DESIGN 1 HUNTER COLLEGE CITY UNIVERSITY OF NEW YORK

This course is required to graduate with a computer science major. You will learn principles of programming, analysis, and design and gain a deep practical knowledge of C++.

[CSCI 13500 Syllabus](#)

[Gradescope](#)

[Coding Style Guide](#)

[FAQs](#)

**Text:** [Cay Horstmann, Brief C++, 3rd ed. eText](#) - please rent the eText for one semester from here

do not buy or rent it from Amazon or Kindle store - you will not get access to the necessary interactive material!

**Linux on Windows Tutorial:** [https://okunhardt.github.io/documents/Installing\\_WSL.pdf](https://okunhardt.github.io/documents/Installing_WSL.pdf)

**Tutoring:** The tutors for this course are available in the Open Lab Session on North 1001B of CSCI 13500.

Schedules will be published soon.

The tutors are there to help you with all of your labs, assignments, and projects! Get as much help as you need.

**Lecture: Monday, Thursday 9:45 - 11:00 AM at West Building 615. The final will be on**

**12/16/21, Thursday, at 11:30 – 1:30 pm.**

**Lecture Instructor:** Tong Yi, email address [ty680@hunter.cuny.edu](mailto:ty680@hunter.cuny.edu). Office hours: Monday Thursday 11-noon.

**Email Questions** You must get hands-on programming help in person during your lab or from tutors.

We will never debug your code over email. You should ask questions during the lab and the lecture.

All other email questions must be sent to your lab instructor listed below.

You must always include your section, name of lab instructor, your name and EMPLID.

**Recitation Instructors** and their schedules are listed as follows. You must attend one section.

**Part of your grade comes from quizzes and assignments in recitation.**

Section	Lab	Room	Instructor	E-mail
<b>13500 sec 1R01</b>	Mo 1:10PM - 3:00PM	North Bldg 1001C	Minh Nguyen	<a href="mailto:minh.nguyen@hunter.cuny.edu">minh.nguyen@hunter.cuny.edu</a>
<b>13500 sec 1R02</b>	Mo 3:10PM - 5:00PM	North Bldg 1001C	Minh Nguyen	<a href="mailto:minh.nguyen@hunter.cuny.edu">minh.nguyen@hunter.cuny.edu</a>
<b>13500 sec 1R03</b>	Mo 5:35PM - 7:25PM	online	Serra Canca	<a href="mailto:serra.canca59@myhunter.cuny.edu">serra.canca59@myhunter.cuny.edu</a>
<b>13500 sec 1R04</b>	We 9:10-11:00AM	online	Yasmeen Hassan	<a href="mailto:yasmeen.hassan14@myhunter.cuny.edu">yasmeen.hassan14@myhunter.cuny.edu</a>
<b>13500 sec 1R05</b>	Th 1:10 – 3:00 PM	North Bldg 1001C	Yasmeen Hassan	<a href="mailto:yasmeen.hassan14@myhunter.cuny.edu">yasmeen.hassan14@myhunter.cuny.edu</a>
<b>13500 sec 1R06</b>	Th 3:10 – 5:00 PM	North Bldg 1001C	Yasmeen Hassan	<a href="mailto:yasmeen.hassan14@myhunter.cuny.edu">yasmeen.hassan14@myhunter.cuny.edu</a>
<b>13500 sec 1R07</b>	Th 5:35 PM – 7:25 PM	online	Minh Nguyen	<a href="mailto:minh.nguyen@hunter.cuny.edu">minh.nguyen@hunter.cuny.edu</a>
<b>13500 sec 1R08</b>	We 5:35 PM – 7:25 PM	online	Shelly Huang	<a href="mailto:sh1424@hunter.cuny.edu">sh1424@hunter.cuny.edu</a>
<b>CSHR-</b>	MoTh	North Bldg	Michael	<a href="mailto:mz631@hunter.cuny.edu">mz631@hunter.cuny.edu</a>

<b>REC</b> <b>Regular</b> *	8:35AM - 9:25AM	1001C	Zamansky	
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\* CSHR-REC Regular is for honor college students only.

## COURSE OUTLINE

DATE	TOPIC	READING: Brief C++	SLIDES	DUE DATES
8/25	<a href="#">Syllabus</a> <a href="#">Gradescope</a> <a href="#">eText features</a> <b>C++ Review</b> <b>Introduction</b> <b>Fundamental</b> <b>Data Types</b>	<a href="#">1.3 Machine Code and Programming Languages</a> <a href="#">1.5 Analyzing Your First Program</a> <a href="#">1.6 Errors</a> <a href="#">1.7 HW Algorithm Design</a>	<a href="#">1.5</a> <a href="#">1.6</a> <a href="#">1.7</a>	<b>E1.7</b> 9/10 E1.7 is modified from the original version in the textbook for the purpose of automatically grading by gradescope scripts. See the problem description in E1.7 posted in gradescope. <b>LAB 1 Intro to Linux and to C++</b> 9/12
8/30	Variables and Arithmetic	<a href="#">2.1 Variables</a> <a href="#">2.2 Arithmetic</a> <b>2.4 PS First Do It By Hand</b> <a href="#">2.3 Input and Output</a>	<a href="#">2.1</a> <a href="#">2.2</a> <a href="#">2.3-4</a>	<a href="#">WE 2.1</a> <a href="#">WE 2.2</a> <b>E2.10</b> 9/9 <a href="#">PS 2.4</a> <b>Project 1A</b> 9/12
9/2	<b>Strings</b>	<a href="#">2.5 Strings</a> <a href="#">6.1 Arrays</a>	<a href="#">2.5</a> <a href="#">6.1</a>	<b>LAB 2 Loops and Arrays</b> 9/19 <b>Project 1B</b> 9/22
9/9	<b>Arrays</b> <b>Loops</b>	<a href="#">4.1 The while Loop</a> <b>4.2 PS Hand-Tracing</b> <a href="#">4.3 The for Loop</a> <a href="#">4.4 The do Loop</a> <a href="#">4.5 Processing Input</a>	<a href="#">4.1</a> <a href="#">4.2-3</a> <a href="#">4.4-5</a>	<a href="#">PS 4.2</a> <a href="#">WE 4.1</a> <a href="#">WE 4.2</a> <b>LAB 3 File I/O, Process Data</b> 9/26 <b>Project 1C</b> 9/28
9/13	<b>More Loops</b>	<b>4.6 PS Storyboards</b> <a href="#">4.7 Common Loop Algorithms</a> <a href="#">4.8 Nested Loops</a> <b>4.9 PS Solve a Simple Problem First</b> <a href="#">4.10 Random Numbers and Simulations</a>	<a href="#">4.6-8</a> <a href="#">4.9-10</a> Squares, Montecarlo code see blackboard	<a href="#">PS 4.6</a> <a href="#">PS 4.9</a> <b>E4.8</b> 9/24 <b>Project 1D</b> 10/3
9/20	<b>Loop examples</b>		Notes in blackboard	
9/23	<b>Decisions</b>	<a href="#">3.7 Boolean Variables and Operators</a> <a href="#">3.1 The if Statement</a> <a href="#">3.2 Comparing Numbers and Strings</a> <a href="#">3.3 Multiple Alternatives</a> <a href="#">3.4 Nested Branches</a> <a href="#">3.8 Application: Input Validation</a>	<a href="#">3.7</a> <a href="#">3.1</a> <a href="#">3.2</a> <a href="#">3.3-4</a> <a href="#">3.8</a>	<a href="#">WE 3.1</a> <b>E3.1</b> 10/1 <b>E3.5</b> 10/1 <a href="#">PS 3.5</a> <a href="#">PS 3.6</a> <b>LAB 4 Printing Shapes</b> 10/3
9/27	<b>Functions</b> <b>Streams</b>	<a href="#">5.1 Functions as Black Boxes</a> <a href="#">5.2 Implementing Functions</a> <a href="#">5.3 Parameter Passing</a> <a href="#">5.4 Return Values</a> <a href="#">5.5 Functions without Return Values</a> <b>5.6 PS Reusable Functions</b>	<a href="#">5.1-3</a> <a href="#">5.4-6</a> Run Code	<a href="#">WE 5.1</a> <a href="#">WE 5.2</a> <a href="#">WE 5.3</a> <b>E5.6</b> 10/9 <a href="#">PS 5.6</a>
			<a href="#">5.7</a>	

9/30	<b>Scope Static Vars</b>	<a href="#">5.7 PS: Stepwise Refinement</a> <a href="#">5.8 Variable Scope and Global Variables</a> <a href="#">5.9 Reference Parameters</a> <a href="#">\-/ Static Variables</a> <a href="#">8.1 Reading and Writing Text Files</a>	<a href="#">5.8</a> <a href="#">5.9</a> <a href="#">StatVar</a> <a href="#">8.1</a> <a href="#">Viz</a> <a href="#">Pyramid</a>	<a href="#">PS 5.7</a> <a href="#">E5.14 E5.15 10/12</a> <a href="#">E8.1 10/12</a> <a href="#">WE 8.1</a> <a href="#">LAB 5 Functions and Prime Numbers 10/13</a>
10/4	<b>Arrays</b>	<a href="#">6.1 Arrays</a> <a href="#">6.2 Common Array Algorithms</a> <a href="#">0's, Squares, Copy, Sum, Avg, Min, Max, Search, Remove unordered</a> <a href="#">Remove ordered, Insert unordered, Insert ordered, Read inputs and find largest.</a> <a href="#">6.3 Arrays and Function</a>	<a href="#">6.1</a> <a href="#">6.2</a> <a href="#">6.3</a> Project 2 in blackboard	<a href="#">WE 6.1</a> <a href="#">WE 6.2</a> <a href="#">Selection Sort</a> <a href="#">LAB 6 Strings and Ciphers 10/17</a> <a href="#">Project 2</a> Due 11/16
10/7	<b>Arrays</b>	<a href="#">Array functions</a> <a href="#">6.4 PS: Adapting Algorithms</a> <a href="#">6.5 PS: Discovering Algorithms by Manipulating Physical Objects</a>	<a href="#">6.4-5</a>	<a href="#">PS 6.4</a> <a href="#">PS 6.5</a> <a href="#">E6.8 10/19</a>
10/14		Review for mid term (see blackboard notes)		<a href="#">LAB 7 Automatic Style 10/31</a>
<b>10/18</b>	<b>MIDTERM EXAM</b>			<a href="#">Binary Search</a>
10/21	<b>Pass by Reference Pointers</b>	<a href="#">7.1 Defining and Using Pointers</a> <a href="#">Pointers Example</a>	<a href="#">Coffee Code</a> <a href="#">By Value</a> <a href="#">By Ref.</a> <a href="#">7.1</a> <a href="#">Ptrs</a>	<a href="#">E7.1 10/30</a> <a href="#">WE 7.1</a> <a href="#">PS 7.6 (1 and 3 only)</a> <a href="#">LAB 8 Image Processing</a> 11/7
10/25	<b>2D arrays</b>	<a href="#">6.6 Two-Dimensional Arrays</a> <a href="#">Print 2D array</a>	<a href="#">6.6</a>	
10/28	<b>Arrays and Pointers</b>	<a href="#">7.2 Arrays and Pointers</a> <a href="#">Code</a>	<a href="#">7.2</a>	<a href="#">LAB 9 Pointers 11/14</a>
11/1	<b>Dynamic Memory</b>	<a href="#">7.4 Dynamic Memory Allocation</a> <a href="#">Viz</a>	<a href="#">7.4</a> <a href="#">Viz</a>	<a href="#">WE 9.1</a>
11/4	<b>Array of Pointers</b>	<a href="#">7.5 Arrays of Pointers</a> <a href="#">Galton Board</a> <a href="#">7.6 PS Draw a Picture</a>	<a href="#">7.5-6</a> <a href="#">Viz</a>	<a href="#">LAB 10 Classes, Enums 11/21</a>
11/8	<b>Class of Objects</b>	<a href="#">7.7 Classes of Objects</a>	<a href="#">7.7-8</a>	<a href="#">E7.16 11/19</a> <a href="#">E7.18 11/19</a>
11/11	<b>Pointer and Objects</b>	<a href="#">7.8 Pointers and Objects</a> <a href="#">5.9 Reference Parameters</a>	<a href="#">Ptrs</a> <a href="#">Viz</a> <a href="#">5.9_Slides</a>	<a href="#">Project 3A 11/28</a> <a href="#">Project 3B 12/5</a> <a href="#">Project 3C 12/12</a>  <a href="#">LAB 11 More Classes 11/30</a>
11/15	<b>Enumerations</b>	<a href="#">9.1 Object-Oriented Programming</a> <a href="#">9.2 Implementing a Simple Class</a>	<a href="#">9.1-2</a> <a href="#">Code</a>	<a href="#">Debugger LAB</a>
11/18	<b>Classes</b>	Project 3 (in blackboard), submit to gradescope.		<a href="#">LAB 12 Vectors 12/5</a>
11/22	<b>Class and Objects</b>	<a href="#">The switch Statement</a> Enumerated types: <a href="#">bool</a> , <a href="#">switch</a> , <a href="#">MyBool</a> , <a href="#">LIKELY</a> , <a href="#">Color</a> , <a href="#">Colors</a> <a href="#">9.3 Specifying the Public Interface</a>	<a href="#">Enums</a> <a href="#">9.3-5</a> <a href="#">Code</a>	<a href="#">E9.3 11/30</a> <a href="#">E9.5 11/30</a>

		<a href="#">9.4 Designing the Data Representation</a> <a href="#">9.5 Member Functions</a>		
11/29	Constructor Separate Compilation	<a href="#">9.6 Constructors</a> <a href="#">9.9 Separate Compilation</a>	<a href="#">9.6</a> <a href="#">9.9</a>	<a href="#">Lab 13</a> 12/12
12/2	<b>Vectors</b>	<a href="#">6.7 Vectors</a> <a href="#">More Vectors</a>	<a href="#">6.7</a>	<a href="#">E6.18</a> <a href="#">E6.20</a> 12/10
12/6	<b>Pointers to Objects Static Member Variables</b>	<a href="#">9.10 Pointers to Objects</a> <a href="#">9.11 PS: Patterns for Object Data</a> <a href="#">Static Variables</a> <a href="#">Static Member Variables</a>	<a href="#">9.10-11</a> <a href="#">StatVar</a> <a href="#">StatMV</a>	<a href="#">Code</a> <a href="#">More Code</a>
12/9	<b>Inheritance</b>	<a href="#">10.1 Inheritance Hierarchies</a> <a href="#">10.2 Implementing Derived Classes</a> <a href="#">10.3 Overriding Member Functions</a> <a href="#">10.4 Virtual Functions and Polymorphism</a>	<a href="#">10.1</a> <a href="#">10.2</a> <a href="#">10.3</a> <a href="#">10.4</a>	<a href="#">10 Extra</a> <a href="#">WE 10.1</a>
12/13	<b>Review</b>	Introduction to recursion (in blackboard) Review		
<b>12/16</b>	<b>Final</b>	11:30 – 1:30 pm	-	-

[ChetSheet like the one that will be given to you on the exam](#)

[2019 Fall Midterm 1](#)

[2019 Fall Midterm 1 Answers](#)

[Important Dates \(for more details, see https://hunter.cuny.edu/students/registration/academic-calendar/\)](https://hunter.cuny.edu/students/registration/academic-calendar/)

Date	Deadline
8/31	Last day to add a course; Last day for 75% tuition refund
9/1	Grade of “WD” is assigned to students who officially drop a course.
9/6	Last day for 50% tuition refund
9/6	College closed
9/14	Last day to drop for 25% tuition refund; Last day to change or declare a major or minor to be effective for Fall 2021 semester
9/15	100% tuition obligation for course drops “WN” Grades assigned Grade of “W” assigned to students who officially drop a course
9/16	No class
9/24	“WA” grades assigned for non-compliance with immunization requirements
10/11	College closed No classes scheduled
11/25/21 – 11/28/21	College closed – no classes scheduled
12/13	Last day to receive grade of “W” is for students who officially withdraw from a course

<b>12/14</b>	Reading Day
<b>12/16</b>	<b>Final of this course</b>