

## **C++ Programming for Engineers**

COP 2274 Section EED1/HYF1

**Class Periods:** Tuesday, 2-3<sup>rd</sup> period, 8:30 AM-10:25 AM

Thursday, 3<sup>rd</sup> period, 9:35 AM-10:25 AM

**Location:** NEB101/Online (Synchronous)

COP 2274 Section EED2/HYF2

**Class Periods:** Tuesday, 5-6<sup>th</sup> period, 11:45 AM-1:40 PM

Thursday, 6<sup>th</sup> period, 12:50 PM-1:40 PM

**Location:** NEB102/Online (Synchronous)

**Academic Term:** Spring 2021

### **Instructor:**

Kwansun Cho

[ckstone@ufl.edu](mailto:ckstone@ufl.edu)

(352) 294-6883

Office Hours: Thursday, 2 PM-4 PM, office location (Online - TBA on Canvas)

### **Peer Mentors:**

Please contact through the Canvas website

- [Section EED1/HYF1] Yashasvi Bhat, [bhat.yashasvi@ufl.edu](mailto:bhat.yashasvi@ufl.edu), office location (Online - TBA on Canvas), office hours (TBA on Canvas)
- [Section EED2/HYF2] Ryan Laur, [ryan.laur@ufl.edu](mailto:ryan.laur@ufl.edu), office office location (Online - TBA on Canvas), office hours (TBA on Canvas)

### **Course Description**

This is an introductory course for those who have little experience in programming and have been looking to obtain a hands-on learning experience to the C++ programming language. Developing problem solving and computational thinking skills in an engineering field is encouraged in this course and emphasized with a reasonably high degree of mathematics.

### **Course Pre-Requisites / Co-Requisites**

MAC 2312 - Analytic Geometry and Calculus 2 with a minimum grade of C

### **Course Objectives**

The main objective of this course is to provide a foundation in C++ programming for engineering problem solving using the C++ programming language. Students will develop the skills to implement software solutions to a wide-range of engineering problems. Furthermore, students will be able to apply these skill sets to other programming languages.

### **Materials and Supply Fees**

Not applicable

### **Professional Component (ABET):**

This course uses several programming assignments that teach students how to effectively develop programming solutions to engineering problems. Students will develop the skills to analyze a given engineering/mathematical question and pose it as a software solution.

### **Relation to Program Outcomes (ABET):**

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	High
3. An ability to communicate effectively with a range of audiences	Low
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	Medium
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

\*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

### **Required Textbooks and Software**

- Title: Absolute C++
- Author: Walter Savitch
- Publication date and edition: 2015, 6th edition (*earlier editions will suffice too*)
- ISBN number: 978-0133970784

**An official textbook is REQUIRED** (see above) and additional course materials will be posted on the Canvas course website. It will be every student's responsibility to be familiar with the relevant chapter(s) of the textbook and the material posted on the course web site each week. **Visual Studio** is an officially supported software for the class. You may consider using the free Visual Studio Community IDE downloadable directly from Microsoft site (<https://visualstudio.microsoft.com/downloads/>). Students may use an alternative software (Xcode, CodeLite, Linux command-line environment, etc...), but these will not be officially supported.

### **Course Schedule**

Week 01 (1/11 – 1/15):	Introduction – Compiling and Running C++ Program
Week 02 (1/18 – 1/22):	C++ Basics / Chapter 1
Week 03 (1/25 – 1/29):	Flow of Control – Branching and Looping / Chapter 2
Week 04 (2/01 – 2/05):	Function Basics / Chapter 3
Week 05 (2/08 – 2/12):	Parameters and Overloading / Chapter 4
Week 06 (2/15 – 2/19):	Review / <b>Exam 1</b>
Week 07 (2/22 – 2/26):	Arrays / Chapter 5
Week 08 (3/01 – 3/05):	Structures and Classes / Chapter 6
Week 09 (3/08 – 3/12):	Constructors and Other Tools / Chapter 7
Week 10 (3/15 – 3/19):	Operator Overloading, Friends, and References / Chapter 8
Week 11 (3/22 – 3/26):	Review / <b>Exam 2</b>
Week 12 (3/29 – 4/02):	Strings / Chapter 9
Week 13 (4/05 – 4/09):	Pointers and Dynamic Arrays / Chapter 10
Week 14 (4/12 – 4/16):	Inheritance / Chapter 14
Week 15 (4/19 – 4/21):	Polymorphism and Virtual Functions / Chapter 15

### ***Class Expectations***

This course runs on a **flipped classroom** design. Students will be expected to work in phases of before class, during class, and after class work every week.

#### **Before** class:

- 1) Read the assigned **chapter** in the required **textbook**
- 2) Watch the **lecture and/or live-coding videos** for a particular module.

#### **During** Hyflex class: (*A personal laptop is REQUIRED during class*)

- 1) Complete and submit **in-class assignments** on the weekly assigned module-related topic *by the end of the class session*.
- 2) Ask any questions to the instructor, peer mentor or classmates.

#### **After** class:

- 1) Complete and submit a **homework** assignment if there is one. All homework assignments will be due on Thursday at 11:59 PM.

In addition, students are expected to complete and submit **two exams** and **one final exam**. All submissions are made through the Canvas course site. Every student is responsible for being aware of all posted course material and all announcements made during class even if they do not explicitly appear on the syllabus.

### ***Attendance Policy***

- For face-to-face (F2F) students:
  - Weekly classes will be held in the designated classroom. You must arrive class on time and be physically present at the time of attendance. You are **REQUIRED** to wear your mask and maintain social distancing at all times during class (*see F2F Course Policy in Response to COVID-19 for more details*).
- Online students:
  - Weekly online classes will be held *synchronously via Zoom*. You must join the designated class link provided through the Canvas website (<https://elearning.ufl.edu>) **on time**.
- For all students:
  - **Regular attendance is REQUIRED** except for excused absences. Attendance will be taken during class. All students must be physically present (F2F students) or join the class Zoom link (Online students) for their attendance to count. **It is important to note that students are NOT allowed to submit in-class assignments without attendance**.
  - Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation

### ***Online Course Recording***

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

### ***F2F Course Policy in Response to COVID-19***

We will have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

- You are **REQUIRED** to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms (Click here for guidance from the CDC on symptoms of coronavirus), please use the UF Health screening system and follow the instructions on whether you are able to attend class. Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms.
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. Find more information in the university attendance policies.

### ***Make-Up Policy***

Makeups for exams, homework assignments, and in-class assignments are NOT normally allowed. If you cannot attend an exam, you must contact the instructor well in advance (at least 7 days before an announced exam date). Failure to contact the instructor prior to the exam will result in a zero. Please also note that late submission of an exam, homework assignment, or in-class assignment will result in a zero. Arrangements will be made for students on a case by case basis for excused reasons. It is every student's responsibility to honor and respect the given deadlines posted on the Canvas course site (<https://elearning.ufl.edu>).

### ***Evaluation of Grades***

All homework assignments are assigned through the Canvas course site. **Please note the deadlines are strictly enforced.** For example, if the deadline is 11:59 PM, any assignment submitted after this time is considered late. It is also each student's responsibility to submit the correct file and ensure the submission is successful before the deadline (please double check your Canvas submissions). If you are unable to submit your homework through Canvas, send a copy of your assignment to your instructor ***before*** the stated deadline! There will be **three exams (two in-class exams and one final exam)** and **all exams must be taken online using Honorlock** and will emphasize the most recently covered material. Exam details will be posted on the Canvas course site.

Assignment	Total Points	Percentage of Final Grade
In-class assignments / Attendance (12)	100 each	36%
Homework assignments (4)	100 each	32%
Exam 1	100	10%
Exam 2	100	10%
Final Exam	100	12%
		100%

### ***Grading Policy***

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67

76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:  
<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### ***Students Requiring Accommodations***

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

### ***Course Evaluation***

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

### ***University Honesty Policy***

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

### ***Academic Dishonesty***

- **Sharing or copying of code** through any medium such as email, text, snapchat etc., and plagiarism, in addition to other dishonest behaviors, are all considered to be academic dishonesty. No information regarding the solutions of assignments and exams may be shared by students except for a discussion at a conceptual level.
- Collaboration (helping out others at a conceptual level through discussions) is encouraged in the course. However, looking at any piece of a classmate’s code, sharing files, searching for solutions found online, or using someone else to complete an assignment is strictly prohibited.
- Any student found to have violated these rules, whether a provider or receiver of an unauthorized help, will be given a zero on that assignment and will be reported to the Honor Court. If students aren’t clear on what constitutes plagiarism, ask the course staff.
- **It is strongly encouraged for you to visit the course staff in-office hours whenever you have doubts.**

### ***Online Exams through Honorlock***

- Honorlock will proctor each student’s exams this semester. Honorlock is an online proctoring service that allows you to take an exam from the comfort of your home. You DO NOT need to create an account, download software or schedule an appointment in advance.

- Honorlock is available 24/7 and all that is needed is a **computer**, a **working webcam**, and a **stable Internet connection**. To get started, each student will need Google Chrome and to download the Honorlock Chrome Extension. The extension can be downloaded at [www.honorlock.com/extension/install](http://www.honorlock.com/extension/install).
- When you are ready to test, log into Canvas, go to your course, and click on your exam. Clicking "Launch Proctoring" will begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, and complete a scan of your room. Honorlock will be recording your exam session by webcam as well as recording screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers, even if it's on a secondary device.
- Honorlock support is available 24/7/365. If you encounter any issues, you may contact Honorlock by live chat, phone (**844-243-2500**), and/or email (**support@honorlock.com**).

### ***Commitment to a Safe and Inclusive Learning Environment***

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, [rbielling@eng.ufl.edu](mailto:rbielling@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto:nishida@eng.ufl.edu)

### ***Software Use***

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

### ***Student Privacy***

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

### ***Campus Resources:***

#### *Health and Wellness*

##### **U Matter, We Care:**

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

**Counseling and Wellness Center:** <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

##### **Sexual Discrimination, Harassment, Assault, or Violence**

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, [title-ix@ufl.edu](mailto:title-ix@ufl.edu)

**Sexual Assault Recovery Services (SARS)**  
Student Health Care Center, 392-1161.

**University Police Department** at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

### Academic Resources

**E-learning technical support**, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.  
<https://lss.at.ufl.edu/help.shtml>.

**Career Resource Center**, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

**Library Support**, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

**Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.  
<https://teachingcenter.ufl.edu/>.

**Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers.  
<https://writing.ufl.edu/writing-studio/>.

**Student Complaints Campus**: <https://care.dso.ufl.edu>.

**On-Line Students Complaints**: <http://www.distance.ufl.edu/student-complaint-process>.