C++ Programming for Engineers

COP 2274 Section EED1
Class Periods: Tuesday, Period 2-3, 8:30 AM-10:25 AM
Thursday, Period 3, 9:35 AM-10:25 AM
Location: LIT 201
Academic Term: Fall 2022

Instructor:
Kwansun Cho
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(352) 294-1383
Office Hours: Thursday, 11 AM-12:20 PM, Online-TBA on Canvas

Peer Mentor:
TBA on Canvas

Course Description
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. (3 credits).

Course Co-Requisites
MAC 2311 - Analytic Geometry and Calculus 1

Course Objectives
The main objective of this course is to provide a foundation in programming for engineering problem solving using the C++ programming language. Students will develop the skills to implement computational 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

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.

An official textbook is not required but highly recommended (see below) 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 recommended textbook and 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 it will not be officially supported.

Recommended Materials

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

Course Schedule

Week 01 (08/24 – 08/26): Introduction – Compiling and Running C++ Program
Week 02 (08/29 – 09/02): C++ Basics / Chapter 1
Week 03 (09/05 – 09/09): Flow of Control – Branching and Looping / Chapter 2
Week 04 (09/12 – 09/16): Function Basics / Chapter 3
Week 05 (09/19 – 09/23): Parameters and Overloading / Chapter 4
Week 06 (09/26 – 09/30): **Exam 1**
Week 07 (10/03 – 10/07): Arrays / Chapter 5
Week 08 (10/10 – 10/14): Structures and Classes / Chapter 6
Week 09 (10/17 – 10/21): Constructors and Other Tools / Chapter 7
Week 10 (10/24 – 10/28): Operator Overloading, Friends, and References / Chapter 8
Week 11 (10/31 – 11/04): **Exam 2**
Week 12 (11/07 – 11/11): Strings / Chapter 9
Week 13 (11/14 – 11/18): Pointers and Dynamic Arrays / Chapter 10
Week 14 (11/21 – 11/25): Inheritance / Chapter 14
Week 15 (11/28 – 12/02): Polymorphism and Virtual Functions / Chapter 15
Week 16 (12/05 – 12/07): **Exam 3**

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:

- Watch the **lecture and/or live-coding videos** for a particular module.
- Read the relevant **chapter** in the recommended **textbook**.

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

- Complete and submit **in-class assignments** on the weekly assigned module-related topic *by **Thursday** at 11:59 PM*.
- Ask any questions to the instructor, peer mentor or classmates.

After class:

- 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 **three exams**. All submissions are made through the Canvas course site. **Each student's lowest-graded in-class assignments** will be dropped (no question asked). Please note that there will be **NO dropped homework assignment grade**. 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

- Weekly class will be held in the designated classroom. Regular attendance on **Tuesday** is ***REQUIRED*** except for excused absences. Attendance will be taken during class. All students **must** be physically present **on time** for their attendance to count.
- **It is important to note that students are *NOT allowed to submit weekly in-class assignments on Thursday without attendance on Tuesday***.
- 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.
- Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies: https://catalog.ufl.edu/UGRD/academic-regulations/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 assignments are assigned through the Canvas course site. **Please note that 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 correct files and ensure the submission is successful before the deadline (please double check your Canvas submissions). If you are unable to submit your assignment through Canvas, send a copy of your assignment to your instructor ***BEFORE*** the stated deadline. There will be **three in-class exams** and each exam will be cumulative with an emphasis on the most recently covered material. Please note that ***every student is required to physically present to take the exams with their own laptop***. Exam details will be posted on the Canvas course site (https://elearning.ufl.edu).

Assignment	Total Points	Percentage of Final Grade
Weekly in-class assignments (12-Drop-1)	100 each	33%
Homework assignments (3)	100 each	30%
Exam 1	100	12%
Exam 2	100	12%
Exam 3	100	13%
		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.aa.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.aa.ufl.edu/public-results/.

In-Class Recording
Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

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/process/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 in-class assignments, homework assignments, and exams may be shared by students except for a discussion at a conceptual level when allowed.
- Collaboration (helping out others at a conceptual level through discussions) is highly encouraged in the course. However, **looking at any piece of your peer's code, sharing files, searching for solutions found online, or using someone else to code your solution 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. Additional penalty like grade deduction may be applied depending on the severity of the case. If you aren't clear on what constitutes plagiarism, ask the course instructor.
- **NOTE**: Students will have the opportunity to inform the instructor in case they took any unauthorized help for a particular assignment **within 24 hours of the submission deadline**. In such a case **they will receive no credit for that particular assignment and no further action will be taken.**
- **It is strongly encouraged to ask the course instructor whenever you have doubts.**

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
• Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, 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 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: https://counseling.ufl.edu, 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

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

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; https://career.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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.

On-Line Students Complaints*: https://distance.ufl.edu/state-authorization-status/#student-complaint*.