

Programming Fundamentals 2
COP 3503C
Academic Term: Summer 2023

Instructor:

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Office Hours: Listed on Canvas

Office Location: Online office hours carried out via Zoom, link available through Canvas

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Canvas website

Course Description

Credits: 4

Second course of a two-semester introductory sequence for those planning further study in computer science, digital arts and sciences or computer engineering. Concepts of computer science and the process of computer programming, including object-oriented programming, procedural and data abstraction and program modularity.

Course Pre-Requisites / Co-Requisites

COP 3502 with a minimum grade of C or an AP exam in computer science with a minimum grade of 4; and MAC 2311 with a minimum grade of C

Course Objectives

- Build and execute C++ programs from command-line and from within an IDE
- Fix problems in an application by utilizing debugging tools and processes
- Utilize testing in the development of software applications
- Read and write data from binary and text files
- Implement classes which adhere to the concepts of object-oriented programming, including abstract and derived classes
- Examine the uses of dynamic memory allocation
- Utilize pointers in the creation of memory-efficient data structures such as linked lists, stacks and queues
- Demonstrate the use of templates to create generic classes
- Demonstrate an ability to solve large programming problems by breaking them into smaller pieces

Materials and Supply Fees

None

Professional Component (ABET):

This course will teach students how to create solutions to computational problems by leveraging the features of a programming language. The skills learned in this course will be applicable to a variety of programming languages beyond C++.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
a. Apply knowledge	High
b1. Conduct experiments	
b2. Statistical design of experiments	
c. Design	High
d. Function on teams	
e. Solve problems	High
f. Professional and ethical responsibility	
g. Communicate	

h1. Economic impact	
h2. Global, societal, and environmental impact	
i. Lifelong learning	Low
j. Contemporary issues	
k. Techniques, skills, and tools for degree program	High

Required Textbooks and Software

Programming in C++

Frank Vahid and Roman Lysecky

Cost: \$77

ISBN: 979-8-203-13551-3

Available through the zyBooks website directly (or purchased through the UF bookstore), instructions on the course's Canvas page

A C++ compiler and/or IDE. There are many out there, but the only two that are officially supported:

CLion (on Windows and macOS)

Visual Studio (Windows only)

zyLabs

The majority of your project assignments will be completed through zyLabs, instructions and links on the course's Canvas page

Recommended Materials

Think Like a Programmer, An Introduction to Creative Problem Solving

V. Anton Spraul

ISBN: 978-1593274245

A good text editor, such as:

Notepad++ (This is my personal favorite)

Sublime Text

Atom, or Vim, or anything else you might prefer

Course Schedule

This structure may change slightly over the course of the semester

Module 1	Introduction to the course and C++
Module 2	Classes
Module 3	Pointers and References
Module 4	Dynamic Memory in Classes
Module 5	Templates and Data Structures
Module 6	Debugging, Problem-Solving and Working in a Command-Line Interface
Module 7	File I/O
Module 8	Binary File I/O (Midterm exam)
Module 9	Inheritance and Polymorphism
Module 10	Maps and Iterators
Module 11	Clean Code and Unit Testing
Module 12	Libraries
Module 13	Sorting
Module 14	Function pointers, lambda expressions, bitwise operations
Module 15	Course wrap-up

Attendance Policy, Class Expectations, and Make-Up Policy

Lecture attendance is not mandatory, but it is expected that you attend—and you are ultimately responsible for the concepts covered on any given day. Most class days will include lecture material, but also Q&A sessions as well as open discussions about the material. Attendance is mandatory for any quizzes or exams which take place in class or a lab. Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>) and require appropriate documentation.

Evaluation of Grades

Grades are assessed on a 1000 point scale. You start the semester with 0 points, and your score can only go up from there. How high it goes depends on how well you complete various the various graded activities in this course.

Category	Total Points	Percentage of Final Grade
Projects	300	30%
Labs and small assignments	300	30%
Exams	200	20%
Quizzes	200	20%
Total	1000	100%

Extra Credit

Extra credit may be offered over the course of the semester, in the form of additional assignments, additional features on existing assignments, and possibly participation in events such as research studies. The maximum amount of extra credit you may earn is up to 20 points, or an additional 2% toward your final grade. This will appear on Canvas as an assignment titled “Extra Credit” in which any points you earn over the semester will appear here.

Grading Policy

Percent	Grade	Grade Points
100 – 93.4	A	4.00
< 93.4 to 90.0	A-	3.67
< 90 to 86.7	B+	3.33
< 86.7 to 83.4	B	3.00
< 83.4 to 80.0	B-	2.67
< 80 to 76.7	C+	2.33
< 76.7 to 73.4	C	2.00
< 73.4 to 70.0	C-	1.67
< 70.0 to 66.7	D+	1.33
< 66.7 to 63.4	D	1.00
< 63.3 to 60.0	D-	0.67
< 60.0 to 0	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Requests for grade boosts or grade rounding

I will not round or arbitrarily increase your grade for any reason. If you think a mistake was made on a graded assignment or an exam question, bring it to my attention and—if it is a mistake—I will correct it. Aside from that, at the end of the semester your grade is the sum of all the points you have accumulated throughout the semester divided by 1000. All requests asking for additional points or opportunities to gain points beyond what was already assigned will be denied.

Grade Challenges

You have **ONE WEEK** after a grade has been posted to ask questions or challenge the grade. After that week period, the grade will stay as-is. This is to avoid students asking for a variety of changes to be made at the end of a semester, long after that part of the class has passed.

Grade Questions and Chain of Command

If you have questions about a grade, please ask your TA/PM first. Managing hundreds of students is not an easy task, and one way I do it is through division of labor. Please ask them first, and if there is an issue they cannot resolve, they will ask me about it.

Strategy for Success

Start early! Most things in life take time to learn. TIME. There is no shortcut. You have to put in the time. In this class, that means spending time to:

- learn the concepts
- read and understand an assignment
- write the code
- debug the code (this will almost always take longer than you think)
- verify results, and submit
- and of course, ask any questions along the way

Time is something that is typically in short supply with students. Furthermore, there is always a wave of panicking students who need help RIGHT NOW in the last few hours before an assignment is due. Don't be one of those students. Start your work early. If you failed to plan appropriately, that is not my emergency (nor that of a TA or a peer mentor).

Slack, Email, and Weekend Hours

I and all of the TAs/Peer Mentors spend a lot of hours assisting students all throughout the week, primarily Monday-Friday. Every now and then we like to spend time not working (surprise, I know). On the weekends, we are not obligated to respond to any Slack messages or emails requesting assistance with a project.

The "weekend" in this course will be Friday after 6pm through Sunday night. If you send a message or an email you may get a response, but we are not "on call" during the weekends to serve as your personal tutor. If you are counting on this, you will likely be disappointed. Contact us throughout the week to get the big questions answered early.

Code Policy

In this course, students are expected to write their own code for all assignments. You are the one who is being tasked with coming up with a solution to the various programming problems in this course—not your friend, not your roommate, not a stranger on the Internet. The reasoning behind this is that later in your educational career (or if you end up in industry) it will be expected that you are capable of solving problems on your own, if and when the need arises. Even in a team-based environment, each member of that team must be capable of carrying their own weight.

There are no group or collaborative assignments in this course. When working on assignments, discussion of those assignments with your classmates is not only inevitable, but it is strongly encouraged! (We often learn very effectively in social environments.) That said, you should discuss the problem in high level terms, not telling someone else (or being told) how to write the code. Here are some examples of what could be considered acceptable and unacceptable:

Acceptable

- Talking about the problem
- Using a whiteboard (or paper, or something similar) to draw out the problem
- Looking at someone else's code to help them identify or fix a bug, AFTER you have already completed that portion for yourself

Unacceptable

- Splitting an assignment's work into multiple parts with other students
- Asking someone to send you their code
- Copying someone else's code into your own submission
- Giving another student your code for ANY reason—once you send your code to someone else, you have no control over where it ends up
- Giving another student step-by-step instructions on how to structure a solution to a problem—it's their job to write their code, not yours
- Looking up solutions to problems and using those solutions yourself verbatim
- Viewing solutions to the problems and mimicking those solutions—ask me, or one of the numerous assistants in this course, for help

Consequences for Honor Code Violations

If you are not capable of completing an assignment on your own, that's okay. Lots of things in life can take time to really "click" for us, and we all learn at different rates. Under no circumstances should you ever consider cheating—that is, submitting someone else's work as your own—as an option. The consequences for doing so will be far worse than if you simply did not do the assignment.

Students will complete this course with honor and integrity, or not at all. Submissions which are believed to be not entirely a student's own work will be reported to administration for disciplinary action. I will recommend the following sanctions be imposed on that student or students:

1. A failing grade (an 'E') for the course
2. That you not be allowed to drop the course for any reason

Regret Clause

If you submit an assignment, in which you engaged in some of the unacceptable practices listed above (or something similar), you may bring it to my attention within 72 hours of the submission. If you do so, I will assign a failing grade of 0 for the assignment, and you will not be reported to the administration.

Deadlines

Deadlines in this course are final. Ultimately, it is your responsibility to ensure that assignments are completed on time, and according to specifications. Students are given ample time in this course to complete each assignment. If you wait until the last day to start something, and something goes wrong on that last day, it is not my responsibility. (I've been there before as a student, and I had to live with the consequences.)

Exceptions can be made for significant hardships as dictated by university policy (e.g. medical issues, death in the family, etc) with supporting documentation. Submissions after the deadline will not be accepted. Students may be granted one (1) single exception to this, according to the following section.

Single-Use Late Submission Exception

You may turn in one (1) assignment up to 24 hours after the deadline, with a grade penalty of 50% of the final score for the assignment (so a 100 would become a 50, a score of 42 would become a 21, etc). This is only applicable to the most recent assignment, and only within the 24-hour period following the deadline. You may use this opportunity only once throughout the entire semester, and you must contact your TA or ET to inform them this one-time exception is being invoked.

Official University of Florida policies:

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

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure 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.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.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.

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>

Recording Privacy

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.

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.

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: <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

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://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

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