Advanced Programming Fundamentals

COP 3504C

Academic Term: Fall 2021

Instructor:
Jeremiah Blanchard
jjb@eng.ufl.edu
352-294-6643

Course Description

Fast-paced introduction to computer science for those with prior programming experience. Explores major concepts of computer science and the process of computer programming, including object-oriented programming, procedural and data abstraction and program modularity. (4)

Course Pre-Requisites

MAC 2311 or MAC 3472 and programming experience

Course Objectives

By the end of the semester, successful students should be able to…

- Design and implement programs in Java and C++;
- Build, run, and debug programs from the command-line and from within an IDE;
- Utilize testing in the development of software applications;
- Read and write data from binary and text files;
- Implement classes adhering to the object-oriented principles (including abstraction / inheritance);
- Understand and use dynamic memory allocation and pointers for memory-efficient data structures;
- Demonstrate the use of templates to create generic classes in data structures (e.g., lists / stacks / queues);
- Demonstrate an ability to solve large programming problems by breaking them into smaller pieces.

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	
3. An ability to communicate effectively with a range of audiences	
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	Low
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	Medium

*Coverage given as high, medium, or low. Empty box indicates this outcome is not covered or assessed in course.

Required Textbooks and Software

Programming in Java / C++
Frank Vahid and Roman Lysecky
Available through zyBooks; See instructions on course's Canvas page

Mobile Computing Requirement
The College of Engineering requires students to have a mobile computing device (laptop) HWCOE requirements for students in its courses (regardless of degree program). Students are required to bring their devices to class.

Course Schedule & Due Dates (Dates and Assignments Subject to Adjustment)

Mod.	Dates	Topic	Reading	Assessments	Due
0	08/23 – 08/25	What is Computing?	Chp. 1	Quiz 0 (Syllabus)	-
1	08/26 – 09/01	Java Language Basics	Chp. 2-3	Quiz 1	Lab 0 (Setup)
2	09/02 – 09/08	Objects & Object Types	Chp. 4-6	Quiz 2	Lab 1
3	09/09 – 09/15	Classes & Inheritance	Chp. 7-8	Quiz 3	Lab 2
4	09/16 – 09/22	Complexity, Searching & Sorting	Chp. 9	Quiz 4	Lab 3
E1	09/23 – 09/29	Q&A / Exam ***[Optional Lab Meeting]***	-	**Exam 1**	Lab 4
5	09/30 – 10/06	Ethics & Software Engineering	Chp. 10	Quiz 5	Lab -1 (Setup)
6	10/07 – 10/13	C++ Language Fundamentals	Chp. 11	Quiz 6	Lab 5
7	10/14 – 10/20	Allocation & Inheritance	Chp. 12	Quiz 7	Lab 6
8	10/21 – 10/27	Memory Management	Chp. 13	Quiz 8	Lab 7
E2	10/28 – 11/03	Q&A / Exam ***[No Lab Meeting]***	-	**Exam 2**	Lab 8
9	11/04 – 11/10	Generic Programming	Chp. 14	Quiz 9	-
10	11/11 – 11/17	Advanced C++ (1)	Chp. 15	Quiz 10	Lab 9
11A	11/18 – 11/21	Design Patterns (A)	Chp. 16	-	-
TG	11/12 – 11/28	***THANKSGIVING BREAK***			
11B	11/29 – 12/02	Design Patterns	-	Quiz 11	Lab 10
12	12/03 – 12/08	Q&A / Exam ***[Optional Lab Meeting]***	-	**Final Exam**	Lab 11

Evaluation of Grades

Category of Assignment	Point Values	Pct of Grade
Quizzes (11-Drop-1)	10 each	10%
Labs (11-Drop-1)	10 each	10%
Projects (4)	100 each	40%
Midterm Exams (2)	120 each	24%
Final Exam	150	15%
Professionalism	10	1%
TOTAL		100%

Earned Percent	Letter Grade	Grade Points	Earned Percent	Letter Grade	Grade Points
93 - 100	A	4.00	73 - 76	C	2.00
90 - 92	A-	3.67	70 - 72	C-	1.67
87 - 89	B+	3.33	67 - 69	D+	1.33
83 - 86	B	3.00	63 - 66	D	1.00
80 - 82	B-	2.67	60 - 62	D-	0.67
77 - 81	C+	2.33	0 - 59	E	0.00

Final grades will be rounded to the nearest whole percentage point. Grades will not be "bumped up", and no additional credit will be offered at the end of the term – so **do not ask**! Any request for a final grade increase, via "bumping" or "extra credit" **will result in a deduction of 1% of the student's final grade**. More information on UF grading policy can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Lab Assignments & Projects
Labs are short programming assignments and homework problems due approximately once a week, while Projects are long assignments due once every 3-4 weeks. Exercises and Projects must be completed individually. The details of project submissions will be given for each assignment and include submissions to (Canvas) on the due date assigned within the project specification.

Attendance Policy, Class Expectations, and Make-Up Policy
are liable for all announcements made lecture and lab. Quizzes may only be taken during the assigned lab period. Make up work for graded class activities are provided given appropriate documentation is presented. Excused absences must be consistent with University policies in the undergraduate catalog and meet University requirements regarding excused absences (https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/).

Code Submissions
Functionality is key to success in computing disciplines, so it is **extremely important** that the guidelines are followed. Failure to follow these instructions will result in penalties.

1) Code must compile / run in debug and release mode. Debug information should never be released in the final version of a software project. **Projects that do not compile AND run will be marked zero**.

2) Include only those files specified by the documents in your archives. Projects should have no directory structure except as explicitly mentioned in the documentation (i.e., relevant files and folders should be submitted in the root of the zip file.) It should be possible to open the archive, copy your files directly into the project, compile, and then run the project without further steps. If the project has naming or organization error(s), its grade will be **zero**.

Course Expectations
Academic Dishonesty will be dealt with strictly. Sharing / copying, "borrowing" of code structure, discussing code structure, looking at code from another student or providing such code, and plagiarism, in addition to other dishonest behaviors, are all considered academic dishonesty. Absolutely no information regarding assignment solutions may be shared by students except at a conceptual level. If students implement algorithms from other sources, they must cite those sources. Students may not copy code from the Internet or other sources under any circumstances. Any student found to have violated these rules, whether a provider or receiver or unauthorized help, will be assigned a zero grade and referred to the Honor Court. **When in doubt, ask.**

Grade reviews must be requested within one week of a grade being posted. After two weeks, no grade will be revisited. In the event of a grade review, the entire assignment will be reviewed.

Students are strongly recommended to attend all lectures and laboratory meetings unless otherwise instructed. Quizzes are proctored in and only in labs (except when noted), and in both labs and lectures important announcements are made that students are expected to follow. Labs may only be submitted by students who attend or who have been excused, and *pair programming is mandatory*. Students who fail to attend lecture and/or lab forfeit their opportunity to attend office hours unless the absence is excused by the instructor of the course.

All assignments are due by the time listed on Canvas. Projects and homework with a cascading deduction: one (1) academic day late for 10% penalty; two (2) for 25% penalty; or three (3) for 50% penalty. Quizzes and tests may not be submitted late for credit except with instructor approval for extenuating circumstances (see below).

Exam and quiz make-ups will not be given except in extenuating circumstances. For make-up consideration students will be required to submit written documentation from a reputable source as evidence. For any planned event (such as a wedding), the student is expected to contact the instructor no less than two weeks in advance for consideration. Please note that there is no guarantee that requests will be accommodated. Social, networking, and club events may be taken into consideration strictly at the discretion of the instructor.

Exams and quizzes may be reviewed during office hours but will not be distributed. Making good assessments takes time and testing. Unfortunately, some disreputable organizations and companies attempt to compromise exams to give some students an edge for a fee. To combat this, we will always allow students to review quizzes and exams during office hours but will not release them en masse.

Students should visit office hours for project help and grade questions. Online students should make plans to be chat with a TA during scheduled office hours or try to arrange an appointment with the TA or instructor. Do not send email to, send private messages to, or "@" instructors or TAs about project help or grades. The TAs and instructor will often try to answer questions when possible in chat, but the way to get personalized help is to visit or make arrangements!

Students should not distract others in class. Students are not compelled to attend against their will. Students should refrain from watching videos; playing games; talking; sleeping; howling; biting toe nails; screeching like a banshee; and other distracting behaviors in lecture or lab.

Important correspondence (other than project help) should be engaged via email. In particular, the chat system is helpful for simple questions and allows students to help one another, but students should not expect a response to important questions via chat. Please allow 48 business hours for a response; the instructor and TAs have many responsibilities and respond to messages as efficiently as is practical.

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.

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.

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 Conduct 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. If you have any questions or concerns, please consult with the instructor or TAs in this class.

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:

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 Resource 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*:* http://www.distance.ufl.edu/student-complaint-process.

Health and Wellness

Covid-19 Protocols:

- You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.

- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus.

- If you are withheld from campus by the Department of Health through Screen, Test & Protect, you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.

- UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the UF Health Screen, Test & Protect website for more information.

- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.

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/.