FLORIDA GULF COAST UNIVERSITY: SPRING 2023
COP 3003: PROGRAMMING II SYLLABUS

TABLE OF CONTENTS

COURSE OBJECTIVES

COURSE CATALOG DESCRIPTION

Students will expand on their knowledge base and skills gained from introductory programming. Topics include, but are not limited to:

- modularity (classes and packages)
- object-oriented concepts (e.g., encapsulation, inheritance, and polymorphism)
- error handling and exceptions
- generics/templates
- dynamic constructs and memory management encompassing pointer arithmetic, parameter passing, and dereferencing
- reuse of API/frameworks/libraries/packages

Relevant programming environments and tools (e.g., build tools), especially in the context of software engineering, are also experienced.

COURSE PRE-REQUISITES

COP 2006 with a minimum grade of C and MAC 2312 with a minimum grade of C. Successful completion of the course will result in 3 credit hours.

LEARNING OUTCOMES

Based upon the objectives of the university and ACM recommendations. At the completion of the course, students will:

- Design and implement a class. [Usage]
- Use subclassing to design simple class hierarchies that allow code to be reused for distinct subclasses. [Usage]
- Correctly reason about control flow in a program using dynamic dispatch. [Usage]
- Compare and contrast (1) the procedural/functional approach (defining a function for each operation with the function body providing a case for each data variant) and (2) the object-oriented approach (defining a class for each data variant with the class definition providing a method for each operation). Understand both as defining a matrix of operations and variants. [Assessment]
- Explain the relationship between object-oriented inheritance (code-sharing and overriding) and subtyping (the idea of a subtype being usable in a context that expects the supertype). [Familiarity]
- Use object-oriented encapsulation mechanisms such as interfaces and private members. [Usage]
- Define and use iterators and other operations on aggregates, including operations that take functions as arguments using the most natural idioms for C++. [Usage]

TENTATIVE SCHEDULE

Week	Subjects Covered
Week 1	Intro and Course Structure & Programming Environment
Week 2	Review of Procedural C++
Week 3	C++ with Modularization (using Functions)
Week 4	Function Templates, References, and Overloading

Week 5	*Exam 1* and Modularization with Classes
Week 6	Class Design and Constructors, Destructors, and Getters/Setters
Week 7	Object Oriented Programming with Class Design (Encapsulation)
Week 8	Dynamic Allocation (strings and vectors)
Week 9	Dynamic Allocation with Pointers and References
Week 10	Pointers and *Exam 2*
Week 11	File Handling
Week 12	ENUM & Polymorphism with Inheritance
Week 13	Inheritance and Abstracts
Week 14	Virtual Classes and Templates
Week 15	Extra: See list in Lesson 1
Week 16	*Final Exam*

GRADING

The lowest assignment and quiz score will be dropped from the semester grade. These need to show the minimum requirements were attempted otherwise a missed assignment or quiz will not be dropped. Late work will be accepted up to the next class period after the due date with an automatic 10% drop in grade for each day late.

PLAGIARISM

Any instance of plagiarism or other academic dishonesty discovered will result in a 0 for that assignment and a drop in grade letter for the class. **Two instances will result in a 0 for the course**.

QUIZ, ASSIGNMENTS, PROJECT, EXAMS

All assignments, quizzes, and project artifacts will be turned in through Canvas**.**

QUIZZES AND ASSIGNMENTS

There will be weekly Quizzes or assignments based on the lectures, lab work, and readings. Assignments will include programming, planning, and independent project work.

EXAMS

There will be 3 Exams assigned through Canvas which will consist of multiple choice, matching, & essay style questions. The first two will be in-class while **the third is optional** and has 2 options:

1. Third Exam is an online Exam (using Lockdown Browser with Webcam) or
2. Third Exam can be skipped, and its score will be the average score of Exams 1 & 2
    a. So if you have 2 100%: third would be a 100% also
    b. If you had a 100 and an 60%: third would be a B (80%)

They will cover:

1. Procedural C++ with Objects
2. Object-Oriented C++
3. Advance Object-Oriented subjects and all other paradigms and subjects

GRADING POLICY

Quizzes: 20%
Assignments: 35%
Project: 25%
Exams: 20%

CLASS

Section 15049
Location: Academic Building 9 (new building) Rm.207
Meeting Time: Tuesday and Thursday: 1:30PM - 2:45 PM

Section 150150
Location: Merwin Hall Rm.103
Meeting Time: Tuesday and Thursday: 3:00PM - 4:15 PM
EXAM: Will be on-campus

INSTRUCTOR INFORMATION

Josiah Greenwell, MS, Visiting Professor
Email: jgreenwell@fgcu.edu
Office Location: Holmes Hall, Rm.227 (next to elevator)
Office Hours: See Excel sheet linked in First Module

REQUIRED TEXTBOOK (NONE, FREE EDUCATION SITES USED):

Learn CPP Tutorials (newer website with modern, C++11 & 17, references and articles)
CPP Tutorials (older website but still valid information for learning)
C++ FAQ (compilation of FAQ questions from creator and maintainers of C++ standard)
Others will be posted in modules as needed

REQUIRED TECHNOLOGY

Though one can run C++ on any system, there are requirements for this course to ensure all students are on a standard platform (environment) for running our programs and completing assignments. This means we will use:

- The Github education pack (so that everything below is free)
- Github repositories for projects and later assignments
- CLion Professional Edition with its default (included) compiler for C++
  - To standardize what compiler and tools are being used
- C++17 (most items will work on C++11 or 14 but a few late term items require 17)
  - Filesystem and file handling in specific has had a major change in 17
  - Before 17 you (basically) had to have a separate library called Boost

RECOMMENDED TECHNOLOGY

Any modern computer system and OS should be fine for the course; however, it must be noted that Silicon Mac(books) have been found to have multiple issues running all systems used for development. CLion will work on Silicon chipsets but this support was only added in April, and we have found minor issues with the Boost Library. **If you are using a Silicon Mac** (Intel is fine) you should **plan office hours** to ensure a working programming environment and you may need to seek alternative systems (online compilers) for certain portions of the course.

ATTENDANCE POLICY

Regular attendance in classes is expected of all students. Unavoidable absences do not excuse students from responsibility for course material. Absences may be excused with a written explanation from a medical professional, faculty member, administration, or athletic director.

ATTENDANCE PROCEDURES

Attendance will be taken at the start and end of class by the Professor or a TA.

MISSED CLASSES

Unexcused absences affect the final course grade according to the following schedule.

> **Unexcused absences:**
> Up to 3 Absences No effect on final grade
> 4 Absences (or equivalent) Final grade lowered by 2 percentage
> 5 Absences (or equivalent) Final grade lowered by 2½ percentage.
> 6 Absences (or equivalent) Final grade lowered by 3 percentage
> 7 or more absences Final grade of 0 assigned
> *Official withdrawal is also recommended if more than 6 absences*

UNIVERSITY STATEMENTS

ACADEMIC BEHAVIOR STANDARDS AND ACADEMIC DISHONESTY

All students are expected to demonstrate honesty in their academic pursuits. The university policies regarding issues of honesty can be found in the FGCU Student Guidebook under the Student Code of Conduct and Policies and Procedures sections. All students are expected to study this document which outlines their responsibilities and consequences for violations of the policy. The FGCU Student Guidebook is available online at www.fgcu.edu/studentlife/studentconduct/

UNIVERSITY NONDISCRIMINATION STATEMENT

Florida Gulf Coast University is committed to ensuring equity and fairness for all University employees, students, visitors, vendors, contractors and other third parties. As such, the University prohibits discrimination on the bases of race, color, national origin, ethnicity, religion, age, disability, sex (including sexual harassment/assault), gender identity/expression, marital status, sexual orientation, veteran status or genetic predisposition with regard to admissions, employment, programs or other activities operated by the University. This prohibition extends to enforcement of Title IX of the Education Amendments of 1972. Questions or complaints should be directed to the Office of Institutional Equity and Compliance (OIEC). The OIEC's phone number is (239)745-4366; the OIEC email address is OIEC@fgcu.edu.

DISABILITY ACCOMMODATIONS SERVICES

Florida Gulf Coast University, in accordance with the Americans with Disabilities Act and the university's guiding principles, will provide classroom and academic accommodations to students with documented disabilities. If you need to request an accommodation in this class due to a disability, or you suspect that your academic performance is affected by a disability, please see me or contact the Office of Adaptive Services. The Office of Adaptive Services is located in the Student and Community Counseling Center building. The phone number is 239-590-7956 and the email is adaptive@fgcu.edu. In addition to classroom and campus accommodations, individuals with disabilities are encouraged to create their personal emergency evacuation plan and FGCU is committed to providing information on emergency notification procedures. You can find information on the emergency exits and Areas of Rescue Assistance for each building, as well as other emergency preparedness materials on the Environmental Health and Safety and University Police Department websites. If you will need assistance in the event of an emergency due to a disability, please contact Adaptive Services for available services and information.

STUDENT OBSERVANCE OF RELIGIOUS HOLIDAYS

All students at Florida Gulf Coast University have a right to expect that the University will reasonably accommodate their religious observances, practices, and beliefs. Students, upon prior notification to their instructors, shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith. Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence. Students shall not be penalized due to absence from class or other scheduled academic activity because of religious observances. Where practicable, major examinations, major assignments, and University ceremonies will not be scheduled on a major religious holy day. A student who is to be excused from class for a religious observance is not required to provide a second party certification of the reason for the absence.

COVID-19 INFORMATION

It is the responsibility of the student to provide medical excuses to professors or others who need to be aware of an absence. Faculty are expected to accommodate students who must miss class due to isolation or quarantine requirements due to a contagious illness or long-term medical condition.

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS)

Counseling and Psychological Services (CAPS) provides free counseling and therapy services (including psychiatry) to all FGCU students. Please call CAPS at (239) 590-7950, Monday through Friday between 8:30 a.m. and 5:00 p.m. to schedule an initial contact appointment. Visit the CAPS website at www.fgcu.edu/studentlife/healthandsafety/caps/ for more information. CAPS offers a 24/7 Helpline at (239) 745-3277 (EARS).

WEB-ENABLED PROCTORING

In order to protect the integrity of online assessments, this course may employ web-enabled proctoring technology that will allow for the web-enabled monitoring of exams and quizzes and/or temporary restriction to a designated online testing website, disabling the ability to print, copy, access other applications or move to any other URL for the duration of the assessment. Students must own a computer device and an associated webcam that meet the minimum requirements of the University's standard remote monitoring system.

INSTRUCTOR RECORDINGS OF COURSES

This course may employ technology that will allow for audio and/or video recording of live class sessions. Class recordings may be made in a physical classroom using webcams or classroom cameras and microphones, as well as in distance classes delivered via Canvas BigBlueButton, MS Teams, or Zoom. This recording technology should be utilized for the sole purpose of enhancing student learning. It may provide for supplemental student instruction via secure links to recorded session(s,) the live stream of courses, presentations of off-site guest speakers and/or the delivery of course instruction utilizing "flipped classroom" methodologies. Student questions and/or comments may be included as a part of any session being recorded.

PLAGIARISM DETECTION SERVICES

Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com or other plagiarism detection services (directly or via a learning management system, i.e. Canvas) for the detection of plagiarism. Turnitin generates a report on the originality of your writing by comparing it with a database of periodicals, books, online content, students' papers, and other published work. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. The use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

STUDENT RECORDINGS OF COURSES:

Consistent with new Legislation most recently effective as of July 1, 2021, a student may, without prior notice, record (video or audio) a faculty lecture for the limited purpose of 1) personal educational use, 2) for use in a complaint against the institution, or 3) for use as evidence in a civil or criminal proceeding. Recordings for any other purpose (except as a permitted accommodation) are not permitted. Recordings that are accomplished in such a way as to cause disruption to the learning environment can be prohibited. Such a recorded lecture may not be made public to a third party (i.e. publish) without the faculty member's prior, written consent. Moreover, students are expressly prohibited from recording any other student in such a manner that personally identifies the student. Some negligible/inconsequential recording of a student's voice as a by-product of recording will not be deemed a violation of a permitted recording.