

Advanced Programming

CSIS-112

CG Section 8WK 11/08/2019 to 04/16/2020 Modified 04/06/2022

Course Description

Continuation of CSIS 111. Further development of discipline in program design, especially for larger programs. Introduction of pointers, simple data structures, recursion, internal sort/search methods. Programming assignments are required.

Requisites

For information regarding prerequisites for this course, please refer to the [Academic Course Catalog \(https://catalog.liberty.edu/\)](https://catalog.liberty.edu/).

Rationale

This course provides a continuation to the language introduced in CSIS 111. It introduces additional language concepts, including pointers, classes, and inheritance. It also emphasizes software engineering concepts relevant to larger programs, such as code reuse, encapsulation, incremental development and testing, and provides an introduction to data structures. This course is essential to completing an understanding of the language that will be used in subsequent CSIS courses or C++ application development.

Course Learning Outcomes

Upon successful completion of this course, the student will be able to:

- A. Discuss the relevance of course material and the use of technology to a biblical worldview.
- B. Describe fundamental terminology for overloading, pointers, dynamic memory utilization, inheritance, polymorphism, and recursion.
- C. Describe how the object-oriented paradigm supports top-down algorithm design and stepwise refinement of software development.
- D. Develop solutions in C++ using encapsulation.
- E. Create solutions in C++ using pointers and dynamic memory allocation.
- F. Implement solutions in C++ using inheritance.
- G. Design solutions in C++ using polymorphism.
- H. Produce solutions in C++ using recursion.

Course Resources

Click on the following link to view the required resource(s) for the term in which you are registered: [Liberty University Online Bookstore \(https://bncvirtual.com/liberty/\)](https://bncvirtual.com/liberty/).

Additional Materials for Learning

- A. Computer with basic audio/video output equipment
- B. Internet access (broadband recommended)
- C. Canvas [recommended browsers \(https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66\)](https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66)
- D. Microsoft Office

E. Visual Studio Express 2019 (Free download available)

F. APA formatting information:

<https://www.liberty.edu/online/casas/writing-center/writing-style-guides/> (<https://www.liberty.edu/online/casas/writing-center/writing-style-guides/>)

☰ Course Assignments

Textbook readings and lecture presentations

Course Requirements Checklist

After reading the Course Syllabus and Student Expectations, you will complete the related checklist found in the Course Overview.

Discussions (2)

Discussions are collaborative learning experiences. Therefore, the student will create a thread in response to the provided prompt for each discussion. Each thread must be at least 300 words and demonstrate course-related knowledge. In addition to the thread, the student will reply to the threads of at least 2 classmates. Each reply must be at least 150 words. At least 1 technical citation and 1 biblical citation must be included in each thread and reply. Current APA formatting is required for any citations.

C++ Programming Assignments (8)

Using Visual Studios Community 2019, the student will complete 8 programming assignments that will give him/her an opportunity to demonstrate mastery of the lessons learned during the assigned or previous module.

Quizzes (7)

Each quiz will cover the Reading & Study material for the module in which it is assigned as well as the preceding modules. Each quiz will be open-book and will have a time limit of 45 minutes. Each quiz will contain a variety of 20 multiple-choice and true/false questions.

Quiz: Comprehensive Final

The student will complete a comprehensive Final which will cover all the material from the course. This quiz will be open-book, contain a variety of 70 multiple-choice and true/false questions and have a time limit of 2 hours.

✓ Course Grading

Course Requirements Checklist	10
Discussions (2 at 50 pts ea)	100
C++ Programming Assignments (8 at 60 pts ea)	480
Quizzes (7 at 40 pts ea)	280
Quiz: Comprehensive Final	140
Total	1010

🏛️ Policies

Late Assignment Policy

Course Assignments, including discussions, exams, and other graded assignments, should be submitted on time.

If the student is unable to complete an assignment on time, then he or she must contact the instructor immediately by email.

Assignments that are submitted after the due date without prior approval from the instructor will receive the following deductions:

1. Late assignments submitted within one week after the due date will receive up to a 10% deduction.
2. Assignments submitted more than one week and less than 2 weeks late will receive up to a 20% deduction.
3. Assignments submitted two weeks late or after the final date of the course will not be accepted outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.
4. Group projects, including group discussion threads and/or replies, and assignments will not be accepted after the due date outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.

Disability Assistance

Students with a disability and those with medical conditions associated with pregnancy may contact Liberty University's Online Office of Disability Accommodation Support (ODAS) at LUOODAS@liberty.edu for accommodations. Such accommodations require appropriate documentation of your condition. For more information about ODAS and the accommodations process, including how to request an accommodation, please visit <https://www.liberty.edu/online/online-disability-accommodation-support/> (<https://www.liberty.edu/online/online-disability-accommodation-support/>). Requests for accommodations not related to disabilities or pregnancy must be directed to the Registrar's Office, which generally handles medical needs support.

If you have a complaint related to disability discrimination or an accommodation that was not provided, you may contact ODAS or the Office of Equity and Compliance by phone at (434) 592-4999 or by email at equityandcompliance@liberty.edu. Click to see a full copy of Liberty's [Discrimination, Harassment, and Sexual Misconduct Policy](https://www.liberty.edu/media/1226/Liberty_University_Discrimination_Harassment_and_Sexual_Misconduct_Policy.pdf) (https://www.liberty.edu/media/1226/Liberty_University_Discrimination_Harassment_and_Sexual_Misconduct_Policy.pdf) or the [Student Disability Grievance Policy and Procedures](http://www.liberty.edu/media/8021/Disability_Grievance_Procedures.pdf) (http://www.liberty.edu/media/8021/Disability_Grievance_Procedures.pdf).

Course Attendance

In an effort to comply with U.S. Department of Education policies, attendance is measured by physical class attendance or any submission of a required assignment within the enrollment dates of the course (such as examinations, written papers or projects, any discussion posts, etc.) or initiating any communication with one's professor regarding an academic subject. More information regarding the [attendance policy](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FOnline%2BAttendance%2BAND%2BNon-Attendance&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613719138&sdata=%2BNBTsPOoXuHAPLfISQRugK7cRSuV6UyC7qD3agf3l2k%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FOnline%2BAttendance%2BAND%2BNon-Attendance&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613719138&sdata=%2BNBTsPOoXuHAPLfISQRugK7cRSuV6UyC7qD3agf3l2k%3D&reserved=0>) can be found in the [Academic Course Catalogs](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.liberty.edu%2Findex.cfm%3FPID%3D791&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=DjjhMiRBFnF%2B2ZJUC8eBd1OdNb26S9ADukODYsilXIA%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.liberty.edu%2Findex.cfm%3FPID%3D791&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=DjjhMiRBFnF%2B2ZJUC8eBd1OdNb26S9ADukODYsilXIA%3D&reserved=0>). Regular attendance in online courses is expected throughout the length of the term. Students who do not attend within the first week of a sub-term by submitting a required academic assignment (such as the Course Requirements Checklist, an examination, written paper or project, discussion post, or other academic activity) will be dropped from the course. Students who wish to re-engage in the course are encouraged to contact Academic Advising to discuss their enrollment options. Students who begin an online course, but at some point in the semester cease attending, and do not provide official notification to withdraw, will be assigned a grade of "FN" ([Failure for Non-Attendance](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FUnofficial%2BWithdrawals&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=MoMvZdPfa69InuVHMHAVgu59ZP0Fw45xJTU9PIBrJ%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FUnofficial%2BWithdrawals&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=MoMvZdPfa69InuVHMHAVgu59ZP0Fw45xJTU9PIBrJ%3D&reserved=0>)). Students wishing to withdraw from courses after the official start date should familiarize themselves with the [withdrawal policy](#).

Grading Scale

A	B	C	D	F
900-1010	800-899	700-799	600-699	0-599

For courses with a Pass/NP final grade, please refer to the Course Grading section of this syllabus for the assignment requirements and/or point value required to earn a Passing final grade.

Add/Drop Policy

The full policy statement and procedures are published in the [Policy Directory \(https://wiki.os.liberty.edu/display/IE/Dropping+and+Adding+Online+Classes\)](https://wiki.os.liberty.edu/display/IE/Dropping+and+Adding+Online+Classes).

Honor Code

Liberty University comprises a network of students, Alumni, faculty, staff and supporters that together form a Christian community based upon the truth of the Bible. This truth defines our foundational principles, from our Doctrinal Statement to the Code of Honor. These principles irrevocably align Liberty University's operational procedures with the long tradition of university culture, which remains distinctively Christian, designed to preserve and advance truth. Our desire is to create a safe, comfortable environment within our community of learning, and we extend our academic and spiritual resources to all of our students with the goal of fostering academic maturity, spiritual growth and character development.

Communities are predicated on shared values and goals. The Code of Honor, an expression of the values from which our Doctrinal Statement was born, defines the fundamental principles by which our community exists. At the core of this code lie two essential concepts: a belief in the significance of all individuals, and a reliance on the existence of objective truth.

While we acknowledge that some may disagree with various elements of the Code of Honor, we maintain the expectation that our students will commit to respect and uphold the Code while enrolled at Liberty University.

Adherence to the principles and concepts established within facilitates the success of our students and strengthens the Liberty community.

The Code of Honor can be viewed in its entirety at <http://www.liberty.edu/index.cfm?PID=19155> (<http://www.liberty.edu/index.cfm?PID=19155>).

Schedule

When	Topic	Notes
Course Overview	Student Acknowledgements	Course Requirements Checklist
Module 1: Week 1	Learn	Read: 3 items Watch: 1 item
	Apply	C++ Programming: Functions and Recursion Program Assignment Quiz: Functions, Recursion, and Random Numbers
Module 2: Week 2	Learn	Read: 2 items Watch: 1 item
	Apply	Discussion: Christian Ethics in Software Development C++ Programming: Class Creation Assignment Quiz: Classes and Objects

When	Topic	Notes
Module 3: Week 3	Learn	Read: 2 items Watch: 1 item
	Apply	C++ Programming: Vectors and Sorting Assignment Quiz: C-Strings, Vectors, Sorting and Searching
Module 4: Week 4	Learn	Read: 1 item Watch: 1 item
	Apply	C++ Programming: Class Composition Assignment Quiz: Inheritance and Composition
Module 5: Week 5	Learn	Read: 1 item Watch: 2 items
	Apply	Discussion: Encapsulation in the Bible C++ Programming: Pointers Assignment Quiz: Pointers
Module 6: Week 6	Learn	Read: 1 item Watch: 1 item
	Apply	C++ Programming: Dynamic Memory Assignment Quiz: Operator Overloading
Module 7: Week 7	Learn	Read: 2 items Review: 2 items Watch: 5 items
	Apply	C++ Programming: Inheritance and Operator Overloading Assignment Quiz: Templates and Inheritance
Module 8: Week 8	Learn	Read: 1 item Review 1 item Watch: 2 items
	Apply	C++ Programming: Polymorphism Assignment Quiz: COMPREHENSIVE FINAL