CSIS 2610/L: Programming and Problem-Solving

Spring Semester 2025 – CRN 20795 / 23566
M-W 5:10pm - 6:25pm / W 6:35pm - 8:25pm Meshel Hall 337 / 350

Course Syllabus and Objectives

Instructor: James W. Dittrich, M.S. Ed., M.C.I.S.
Office: YSU University Relations - Tod Hall 135
Phone: 330.715.3342 (cell, please *SMS text* only and do not abuse the privilege)
Email: james.dittrich+YSU@gmail.com
Office Hours: 4pm - 5pm M-W, or by appointment
Website: https://jwdittrich.people.ysu.edu/CSIS_2610/

Prerequisites
MATH 1511 or MATH 1513 or MATH 1552 or Level 50 on Math Placement Test.

Programming Sequences
CSIS 2610: Programming and Problem Solving covers the material in CSIS 1595 and 2605 in a single semester. If you do not have prior experience with programming (and the prerequisite of Math 1513 or Level 50 on the Math Placement Test), then you should consider registering for that course sequence instead. Note that credit will not be given for both CSIS 1595/2605 and CSIS 2610.

An alternative path is CSIS 1595: the first in a two-course sequence meant to give a comprehensive introduction to the design and implementation of computer programs. The second course in the sequence, CSIS 2605: Fundamentals of Programming and Problem Solving 2, builds on the material introduced in this course (and should be taken in the following semester if you plan on taking it).

Textbook
• YSU Bookstore Digital Rental (180 days): Starting Out With C++: From control structures through objects (10th Ed), Gaddis – ISBN-13: 822-0145121640
Or if you prefer *print* options that you will *own* indefinitely:
• Starting Out With C++: From control structures through objects (Brief Version - 9th Ed/Loose Leaf), Gaddis – ISBN-13: 978-0134996042
• Starting Out With C++: From control structures through objects (9th Ed), Gaddis – ISBN-13: 978-0134498379

Other Materials
A user account on https://discord.com (required) for collaboration / screen shares / voice chat.

You will be provided one USB flash drive for this course for using VirtualBox in the labs, backing up your code offline, as well as to bring to office hours if you have questions about an assignment. As with any other storage, you should back it up regularly (your YSU student account includes OneDrive)!

Description
Problem solving methods and algorithms using a high-level programming language. Designing, coding, debugging, and documenting programs using techniques of good programming style. Three hours lecture, two hours lab.

Learning Objectives
This course is meant to introduce you to:

- Concepts common to all programming languages (including data types, numeric and string manipulation, control structures, and functions).
- Principles of program development (including development environment tools, modular program design, testing and debugging, and documentation).
- The C++ programming language and program compilation.
- The GNU/Linux operating system and shell commands/concepts.

Grading
Your grade is determined from the following sources:

- **Programming labs and participation** (10%) – small assignments at the beginning of the semester
- **Programming projects** (40%) – two large and involved pair projects during the latter parts of the semester
- **Exam 1** (15%) – Wed, Feb 28th – **Lab due Sun (3/3) 11:59pm**
- **Exam 2** (15%) – Wed, Mar 27th – **Lab due Sun (3/31) 11:59pm**
- **Final Exam** (comprehensive, 20%) – Mon, April 29th @5:30-7:30pm – **Lab due Fri (5/2) 11:59pm**

Programming Assignments and Projects
In general, programming assignments will be handed out on a Wednesday, and will be due the following Monday. These will be relatively simple exercises meant to give you practice with the current programming topic.

There will also occasionally be larger projects meant to give you experience in designing and developing significant programs based on the principles introduced earlier in the course.

Grading of the assignments will only partially be based on their correctness. Grades will also be based on good programming style and documentation, clarity of thought, and general cleverness in design approaches. I give ample opportunity to earn bonus points for inclusion of extra features and program functionality.

Late assignments will be penalized at 10% per working day, and no assignments will be accepted after solutions are posted (generally one week after the due date). Work on these assignments **must be your own** (see below on academic honesty for more details). AI assistive tools (ChatGPT, Copilot, Ghostwriter, etc.) that write your lab code for you are ***cheating*** because they **deprive you of the ability to learn** and think for yourself with the concepts of this course!

Lectures/Labs
Each class day will consist of either a lecture section (Mondays and Wednesdays from 5:10 to 6:25) in room 337, or a lab section (Wednesdays from 6:35 to 8:25) in room 350.

Some of the lab time may be used for short demonstrations and debugging exercises related to the current topic. The remaining lab time may be spent working on and getting help with the homework assignments.

However, note that you will be expected to do most of the work on the assignments outside of class/lab time. Usually that will involve either Virtualbox or working natively on your own personal hardware. C++ compilers are available in all of the Meshel Hall labs, and a code editor such as Sublime Text 4 is available for download from https://www.sublimetext.com. For specific advice on installing and using build tools on your platform, please see me and I will do my best to guide you to the correct resources.

Faculty Evaluations

Any course is only as good as the instructor's ability to engage with students and make the material meaningful and relevant to your current and future endeavors. Your insights are valuable; in order to continuously improve and fine tune the learning activities and address the differences in student learning styles, course evaluations are typically made available after Midterm Exams via Web link, watch your student email for further details. I will remind you to take the opportunity to provide feedback at the conclusion of the course.

Honors Contracts

This class is eligible for an honors contract, if you are interested in receiving honors credit for this course, please inquire as soon as possible to discuss possible supplemental projects/papers that will qualify.

Important Dates for Spring 2025 Semester

01/06/2025	Spring Term BEGINS
01/13/2025	Last day to add or change a grading option
01/19/2025	Last day to withdraw and receive 100% refund or reduction in charges
01/20/2025	UNIVERSITY CLOSED (MLK Day: Monday, January 20th)
03/03/2025	Spring Break BEGINS - No classes, offices open
03/09/2025	Spring Break ENDS - classes resume Monday, March 10th
03/19/2025	Last day to withdraw with a grade of "W"
04/29/2025	Final Exam period - Monday April 29th, 1730-1930 (5:30pm-7:30pm)
05/03/2025	Spring Term ENDS
05/05/2025	Course grades posted to Penguin Portal
09/01/2025	Last day for completing an "I" grade for Spring 2025

Topic List and Tentative Calendar

DRAFT

Week	Lecture Topics
1 (1/5)	Review Syllabus, Introduction to programming and labs, Virtualbox, Linux shell basics **reading: Chapter 1**
2 (1/12)	Basic I/O, variables and assignment **reading: Chapter 2**
3 (1/19)	***1/20 MLK Day - NO CLASS*** Data types, arithmetic operators and expressions, operator precedence **reading: Chapter 2**
4 (1/26)	Console input, type conversion and casting, formatting output **reading: Chapter 3**

5 (2/2)	Math libraries, randomness **reading: Chapter 4**
6 (2/9)	Conditional statements and relational operators, testing programs with branches, nested control statements, Input validation **reading: Chapter 4**
7 (2/16)	Counter loops, conditional loops, testing programs with loops, algorithm design and program development **reading: Chapter 5** *Project 1: Design with branching and loops*
8 (2/23)	***Exam 1*** *Wed, Feb 26th* Reading from and writing to text files, File I/O, introduction to functions **reading: Chapter 6**
9 (3/2)	***SPRING BREAK - NO CLASS*** **reading: Chapter 7**
10 (3/9)	Scoping and parameters, large-scale program design and decomposition using functions, testing with functions **reading: Chapter 8** *Project 2: Design with functions*
11 (3/16)	Arrays and vectors, parallel arrays, 2d & 3d arrays, searching and sorting arrays **reading: Chapter 9-10**
12 (3/23)	***Exam 2*** *Wed, Mar 26th* String manipulation, structures **reading: Chapter 12**
13 (3/30)	Struct arrays, pointers, addressing, call-by-value vs. call-by-reference, dynamic memory allocation *Project 3: Design with data structures* **reading: Chapter 11**
14 (4/6)	Pointers to Arrays, Pointer Arithmetic, Passing pointers as function parameters, pointers as return types **reading: Chapter 18**
15 (4/13)	Introduction to OOP, Object Classes, constructors, destructors, public & private, methods **reading: Chapter 13-14**
16 (4/20)	*Lab time, Q&A, and Project 3 troubleshooting* *Wed, Apr 23th: Final Exam Review*
16 (4/27)	Finals Week - https://ysu.edu/registrar/final-exam-schedule ***Comprehensive Final Exam Mon, April 28th @1730-1930 (5:30pm-7:30pm)***

General Course Policies and Guidelines

Grading

The course grade will be based on the required material:

- 90% will guarantee at least an 'A' for the course,
- 80% will guarantee at least a 'B' for the course,
- 70% will guarantee at least a 'C' for the course, and
- 60% will guarantee at least a 'D' for the course.

Assignment Submission

Most assignments that you write for the class will be submitted via email. When submitting assignments, do the following:

- **Submit to the instructor's preferred, correct email address**, as above (Gmail).
- Include your name(s), course number, and the title of the assignment in the subject header.
- Attach all code/documents. If there are issues with the size/number of attachments, please use a zip utility to compress into a single file. Files should be named in the general form of: jwdittrich_LabN.cpp

*Assignments that do not follow this protocol **will not be scored**, and you will receive zero credit unless resubmitted.*

Due Dates and Late Assignments

An assignment (including programs and projects) is late if it is not IN MY POSSESSION (either as hardcopy or electronically) by midnight on the due date. Late assignments may be penalized at some percentage (usually 10%) per day late (the weekend counts as one day), and no credit will be given for assignments turned in after solutions have been discussed or handed out. Extenuating circumstances (such as nonfunctional labs) may be recognized if they become a chronic problem.

Attendance

The YSU Attendance Policy addresses excused absences for participation in university-sponsored events, government-related activities, religious observances, death of a family member, and documented personal illness. Describe your specific course attendance policy for unexcused absences.

Class attendance is optional, except for students who are receiving VA benefits, or in situations (such as group meetings) where your absence would be detrimental to other students in a group. However, missing class is not an acceptable excuse for failure to complete required material on time. Every lecture will cover material related to assignments and exams, and in general the grades in programming classes are directly related to the ability to have meaningful dialogue with the instructor. Material that is presented in class will not be covered again outside of class – if you miss class, it is up to you to find out what was covered and to get the notes from someone else. *Historically, the best predictor for success in this course is **your attendance**.*

Exams

Exams will cover material presented in class and corresponding required sections in the text, and will also usually relate to material covered in the homework. Makeup exams are allowed, but only for compelling and verifiable reasons. I need to be informed as soon as possible if you need to take a makeup test (ideally, before the exam is given), and I reserve the right to refuse if too much time has passed since the exam, or if no compelling reason is given.

Office Hours
The best way to get help with an assignment is to stop by my office during office hours. Many problems that you might get "stuck" on for hours upon end can usually be fixed with my help within a few short minutes.

Email
The best way to reach me with questions outside of office hours is Discord direct messages. I will attempt to answer within 48 hours (except for holidays, weekends, and breaks). Items sent to my campus email address do NOT get to my mobile devices, and I therefore cannot guarantee prompt responses. There are some things that you can do to help out:

- Text me or Discord DM me if you send an email to let me know you have an urgent question.
- Include your name and course number in the subject (otherwise it might not make it through the spam filters). Follow up your email with a quick text letting me know you've emailed.
- Be as specific as possible about the question or problem.
- If it is a problem with a program, be sure to attach the relevant source code. However, depending on the type of program and where I happen to be, I may not be able to help right away (my office hours are usually better for getting help with programs); if it's a simple issue, copy-pasting me the relevant section of code in your Discord DM can help!

Most assignments that you write for the class will be submitted via email. When submitting assignments by email, do the same things:

- Include your name, course number, and the number of the assignment in the subject.
- Attach all source code documents. If there are issues with the size/number of attachments, please use a zip utility to compress the collection into a single file.

Class participation
If you do not ask questions in class, you will not get as much out of the class as you could. Your class participation will be based on the instructor's assessment of whether you are regularly involved in the class over the course of the semester.

- **Note:** Class participation ***may*** affect your grade if there is a borderline grade decision.
- If you receive a failing grade in class, and have missed 25% or more of the classes, you will receive a **NAF** (Non Attendance Failure) as your final grade. This may negatively impact your future financial aid eligibility.

Mandatory Statement of Non-Discrimination from the University
Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion, or veteran/military status in its programs or activities. Please visit the Equal Opportunity and Policy Development & Title IX website for contact information for persons designated to handle questions about this policy.

Students with Disabilities
In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course, please contact me privately to discuss your specific needs. You must be registered with the Academic Success Center Accessibility Services, located at Kilcawley Center 2082, and provide a letter of accommodation to verify your eligibility at the beginning of the semester or when given an

assignment for which an accommodation is required. You can reach ASC Accessibility Services at 330-941-1372.

Academic Support
The Marion G. Resch Academic Success Center is a resource on Campus established to help students successfully complete their university experience. Please phone (330) 941-3538 or visit the Center for assistance in tutoring or for individualized assistance with social and academic success. The main Center is located in Kilcawley West below the bookstore. For additional support, see this list of Student Resources.

Ethical/Academic Standards

AI Use Prohibited
Students are not allowed to use generative artificial intelligence such as ChatGPT on assignments in this course. Each student is expected to complete each assignment without substantive assistance from others, including automated tools. Any use of AI tools for work in this class may be considered a violation of the *YSU Code of Conduct*.

Academic Honesty
As outlined in The Student Code of Conduct, all forms of academic dishonesty are prohibited at Youngstown State. This includes plagiarism, the unauthorized use of tools (including Generative AI) or notes in taking tests or completing assignments, fabrication of data or information used for an assignment, working with others without permission from the instructor, and more. A student who is believed to have violated the academic integrity policy will meet with the instructor to discuss the allegations. The student may accept responsibility for the violation and any sanctions selected by the instructor, or they have the right to ask for a hearing before a hearing panel. The full Academic Integrity policy can be found in Article V of The Student Code of Conduct, while further information on University procedures for alleged academic integrity violations can be found in Article V.

Academic honesty is both expected and required. HELPING fellow students is acceptable, and is actually a very good way to learn the material. COPYING is NOT acceptable, laughably easy to detect, and will result in loss of credit for the assignment, and possibly failure of the course. Follow these guidelines:

- If you receive help with an assignment, then you must acknowledge that help in the documentation (your grade will not be affected unless otherwise announced).
- If you give help to another student, then it is your responsibility to make sure that they fully understand the problem and solution – just giving someone code is worse than no help at all.
- Copying solutions from the Web, especially from notorious “do my work for a bounty” sites, has been detected in the past and dealt with appropriately under this policy. Yes, I too can use online search tools - just as well as anyone in this field, but probably better than most!
- Generative AI does not really understand code the way humans do - and using these tools deprives you the ability to learn. This is also easily detected; please do not resort to this out of desperation.
- *The bottom line: if you are not sure how to approach a problem, or are stuck at some point, PLEASE SEE ME FIRST FOR HELP.*

Unless specified otherwise, all written exams are closed book (this includes notes, smartphones, etc.). Any suspected cheating on an exam will result in failure for the course.

I strongly encourage you to discuss any topic and/or share ideas with your peers. That's the way good science ought to happen. As a professional though, you should acknowledge any significant discussions in your homework/projects. However, when the time comes to write the homework, such discussions are no longer appropriate. The solution or program must be your own inspiration (although you may ask the instructor for help in writing or debugging). DO NOT COPY ANOTHER PERSON'S HOMEWORK OR USE GENERATIVE AI OUTPUT UNDER ANY CIRCUMSTANCES. To do so is a clear violation of ethical/academic standards and will result in loss of credit for any assignment and possible course failure.

For further information, see the section on Academic Dishonesty in the *Undergraduate Bulletin*. See also the *CSIS Acceptable Use Policy for Lab Standards*.

Classroom Etiquette

Your fellow students deserve an environment without disruptions to learning. Examples include:

- Conversing during lecture
- Printing in labs during lectures
- Texting/social media
- Web surfing
- Cell phone use (please change ringtones to silent, and exit the classroom for emergency calls)
- Eating or drinking (prohibited in our labs)
- Exhibiting signs you are sick (please stay home for our collective well-being)

  If you engage in these activities repetitively, you will be kindly asked to leave.

On the other hand, asking questions during lectures is very strongly encouraged. I frequently pause to confirm that everyone understands the concepts being discussed. If you are confused about a topic, chances are that many other people are as well! If I do not provide an opportune time for you to ask your question, **please feel free to interrupt me** before I continue.

Incomplete Grades

Incomplete grades are strongly discouraged. However, an incomplete grade may be assigned under the following conditions:

- The student must request in writing that an incomplete grade be assigned.
- The student's previous work in the course must have been satisfactory.
- The reason(s) must be beyond the student's control, and deemed justifiable by the instructor.

Insufficient time is NOT a justification for an incomplete. Also note that all incompletes must be made up within two months; otherwise, they automatically revert to an F.

Airborne Pathogen Safety Statement

If you are feeling unwell, I strongly encourage you to stay home, and get notes from a classmate. If you are observably exhibiting symptoms of airborne viruses (such as repeated coughing and/or sneezing), out of consideration for your peers, I will kindly ask you to leave class and go home. As attendance is not strictly mandatory, I do not require a physician's note, except in cases where an exam or project deadline would be missed without making a prior arrangement to fulfill these obligations. As long as I have prior notice, that will not be necessary – and you will find that I am quite reasonable and flexible with scheduling, so that you can fulfill the requirements of the course.

The Instructor reserves the right to revise the above flexibly and with notice, based on their own discretion.