**Governor’s School for Science and Technology**

**Introductory Computer Science**

**Fall 2022 - Spring 2023**

M, T, W, Th – 95 mins

**Instructor:** Elizabeth Jesseman

**Email:** elizabeth.jesseman@nhrec.org

# Office Location: A-80

**Office Phone:** (757)-766-1100 ext. 3320

# Important Dates:

* First Day of Class: Monday, August 29
* Last Day of Class: Friday, June 9

# Student Email Policy

Students are encouraged to communicate with their instructors via Canvas. When communicating outside of Canvas by email, students must use their GSST (NHREC) email account when contacting their instructor or interacting with classmates. Students are responsible for checking their Canvas inbox and their GSST e-mail account regularly.

# Instructor Email Response Policy

Students are also encouraged to email the instructor with questions about their projects. Email is answered within 24 hours during the week and within 48 hours on the weekend.

# Course Description:

The course begins with a broad introduction into computer science, along with basic coding structure in C++ and Java. Further into the course, we focus heavily on computer programming and object-oriented design in the C++ and Java languages. The course will also be partnering with the engineering strand in the EDIE lab to work on EDIE lab projects.

# Course Purposes and Objectives:

## Fall Semester

* Briefly touch on the history of computers, and binary values and the number system
* Review the problem-solving steps in computer programming
* Write C++ and Java code that uses file-based Input/Output
* Implement value-returning and void functions using value and reference parameters.
* Implement structured data types using C++ struct
* Use header files for structured data type definitions
* Implement multi-dimensional arrays containing simple and structured data types.
* Compare and contrast C++ with the Java programming languages.

## Spring Semester

* Explain how pointers are defined and used to access variables.
* Explain how dynamic memory is allocated and managed
* Write code that efficiently creates and manages dynamic memory using pointers
* Demonstrate ability to design and implement computer-based solutions to problems in a variety of application areas.
* Demonstrate the ability to read and understand a large program consisting of several classes and interacting objects and make modifications and additions to that program.
* Demonstrate ability to use advanced data structures such as sets, stacks, queues, linked lists, maps, and trees.
* Demonstrate use and implementation of commonly used algorithms and data structures and select the appropriate algorithms and data structures to solve problems.
* Design and implement a program to efficiently solve computer-related problems of substantial complexity requiring a program between 500 and 2000 lines of working code, using structured procedural design methods, functional decomposition, and no global variables.

# Methods of Instruction

Come to class on time with a programming laptop for coursework. If you do not have one, it is not compatible, or cannot be used for the course’s purposes, one will be provided to you. We start with a lecture and assign classwork that is due by the end of tomorrow’s class or by the end of Monday’s class if on a Thursday. After completing a chapter, there will be a quiz. There will also be test(s) each quarter. Fridays will focus primarily on the EDIE labs.

# Textbook(s) used:

Computer Science Illuminated, 7th Edition

Nell Dale and John Lewis

Jones & Bartlett Learning, 2016

ISBN: 9781284155617

C++ Programming: From Problem Analysis to Program Design, 8th Edition

D.S. Malik

Cengage Learning, 2018

ISBN: 978-1-337-10208-7

Java Programming: From Problem Analysis to Program Design, 8th Edition

D.S. Malik

Cengage Learning, 2012

ISBN-13: 978-1-111-53053-2

ISBN-10: 1-111-53053-x

# Class Policy

* Arrive on time
* Raise your hand before speaking. If you have questions about what the teacher or classmates are talking about, you can write them down and ask when they finish.
* Do not work on different course work if your work for this class is unfinished. That includes both classwork and homework.
* Respect. Respect the teacher, your peers, and yourself.
* Do not use your phone or walk out of the classroom without permission during a lecture, that includes breaks in between slides. You can do that when the teacher finishes her teaching.
* Please refrain from using your phone so that you are not distracted from your work because classwork is often due by the end of class.
* For PM students, you are allowed to have your lunch in class, but try to not make too much noise and be sure to clean up after yourselves.
* If you have a question or have any trouble understanding the course, please do not hesitate to ask the teacher for any clarification or assistance. You can ask during or after class, or send an email.

# Submissions of non-code

Some assignments will not be code-based and those need to be typed **– not handwritten.** Either in a text document (.txt, .rtf, .md), word document (.docx), or PDF document.

# Submissions of code

Throughout the school year, most submission will be of source code files. Please follow these instructions when submitting

* If a program requires more than 1 file, please submit those individually, i.e., not as a zipped folder
* Detailed algorithm at start of code.
  + Explain step-by-step how your code works
  + The audience is anyone who is coming along to read your code
* The program must have a header at beginning of code.
  + Title of program
  + Student ID
  + Date of Submission

# Late Submission Policy

If you are late in turning in an assignment it is 15% off for each day the assignment is late, i.e. if an assignment is due on Sunday, you have until that week’s Friday to turn it in with a late penalty. Otherwise it will be marked with a 0.

# Grading

9-week (quarter) grades are computed as:

|  |  |
| --- | --- |
| Classwork: | 30% |
| Homework: | 40% |
| Quizzes: | 10% |
| Tests/Projects: | 20% |

# Grading Scale

|  |  |
| --- | --- |
| 90-100: | A |
| 80-89: | B |
| 70-79: | C |
| 60-69: | D |
| Below 60: | F |

# Dual Enrollment Disclaimer

While the Governor's School for Science and Technology (GSST) will do all in its power to secure dual enrollment (DE) status for its courses, dual enrolled course credits are not guaranteed. Since the Virginia Community College System (VCCS) and Virginia Peninsula Community College (VPCC) set the criteria for DE and must approve each course and instructor, unavoidable circumstances that are not within the control of GSST may change the DE eligibility of any given GSST course.

Alternative pathways for meeting specialty program requirements (E.g.

concurrent Associates Degree) should be discussed in advance with the home high school counselor.

# VPCC Policies and Statements

* VPCC’s college policies on academic honesty are available online at <https://www.tncc.edu/about/policy/handbooks/student-handbook>
* “The Americans with Disabilities Act of 1990 (ADA) and section 504 of the Rehabilitation Act provides protection form illegal discrimination for qualified individuals with disabilities.”
* “Student should remain at home if they have symptoms of a contagious disease that may endanger the health of others at the New Horizon’s Governor’s School for Science and Technology. Please contact your instructor by phone or email if you miss more than one day of class. When you are ready to return to class, submit a doctor’s statement or medical clearance that authorizes your return. While away from class, you will be expected to maintain progress in all course requirements.”