# BRISTOL
## COMMUNITY COLLEGE

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## CIS-261 Introduction to Computer Systems

**Fall 2021**

## Course Information

| INSTRUCTOR: | Igor Kholodov |
|---|---|
| **EMAIL:** | **Igor.Kholodov@bristolcc.edu** |
| **PHONE:** | **774.357.3328** |
| **OFFICE HOURS:** | **Mon, Tue, Wed, Thu, 8:00 am - 10:00 am via Zoom** |
| SCHEDULE AND LOCATION: | This course is Fully Online. No meetings at a specific time. |

## Course Description

This course is an introduction to major components of computer systems. The course introduces fundamental concepts of computing systems such as binary arithmetic and data representation, the Von Neumann model for processing computer programs, the operation of memory, instruction set, and machine and assembly language programming. It systematically presents the levels of transformations from machine language to assembly language to high-level language. The course studies the role of such systems software components as assemblers, compilers, linkers, loaders, and operating systems. The course has a strong project component. Pre or co-requisite: CIS 158 or permission of the instructor. Co-requisite: MTH 243. Three lecture hours and two lab hours per week. Instructional Support Fee applies. Competency met: Technical Literacy (8.0) 4 credits Fall.

## Student Learning Outcomes

1. Identify and describe different types of computing machines.

2. Describe distinguishing components of Von-Neumann Architecture.

3. Understand principals of machine language and program in assembly.

4. Describe the relation between high level languages and assembly.

5. Explain how bits and bytes are organized to represent data electronically.

6. Describe how digital logic is used to build circuits to process information.

## Instructional Objectives

Upon completion of this course, the students should be able to do the following:

1. Describe how computing machines are organized internally

2. Identify and explain the design trade offs between different computing machines

3. Describe how computers perform calculations

4. Define systematic sequence of transformations between layers of abstraction.

5. Indicate program organization in memory

6. Understand program stack, stack frames, procedure calls, and parameters

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# Required Reading

Free online book:

Author: Paul A. Carter Paul A. Carter (C) 2019

Title: PC Assembly Language (PDF)

# Methods of Instruction

The course website provides online videos and reading handouts added each week. The site is used extensively for completing laboratory projects and discussion of home work assignments. The students are expected to utilize the website on a weekly basis. If you miss a class, be sure to check the weekly assignments section. All work and the corresponding due dates are posted there.

# Grading

*Example:*

| CRITERIA | PERCENTAGE |
|---|---|
| Discussion Board Participation | 10% |
| Laboratory Exercises | 50% |
| Home Work Assignments | 30% |
| Final Project | 10% |

**Late Assignments:**

All assignments are due in two weeks after the posting date. Late assignments will result in a 10-point penalty for each week past the due date.

**Course Grades:**

At the end of the semester students will receive one of the following grades based on their performance:

| A+ = 97-100% | A = 93-96% | A- = 90-92% | B+ = 87-89% | B = 83-86% | B- = 80-82% |
|---|---|---|---|---|---|
| C+ = 77-79% | C = 73-76% | C- = 70-72% | D+ = 67-69% | D = 63-66% | D- = 60-62% |
| F = 0-59% | | | | | |

# Attendance Policy

Attendance in this course is important to your success. It is not enough to just "log in" to the course website on a weekly basis. You should actively participate in the discussion forum and make submissions to the weekly assignments. Communication with the instructor to ask course-related questions is also credited as a participation in the course.

# Withdrawal Policy

**Students are responsible for withdrawing officially if they stop attending any or all classes. A grade of "F" will be assigned to any student who stops attending a course but does not officially withdraw.** Withdrawals are accepted until the tenth week of classes of a 14-week semester or an equivalent amount of class time for shorter duration courses. Students may withdraw online in accessBCC, in person at any Enrollment Center, or via their college email to enrollmentservices@bristolcc.edu. Email requests must come from the student's Bristol college email address and must include the student's name, Bristol student ID number, and course information (CRN and/or course and section

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number). Email from non-college accounts will not be accepted. Students forced to withdraw due to extreme hardship after the withdrawal date may contact Enrollment Service to request a change in enrollment status.

Withdrawals affect Satisfactory Academic Progress and can place the student at risk for academic probation or dismissal; See [Academic Standing](#) in the Academic Information section of this catalog for further details. Students who use financial aid and who subsequently withdraw may be required to return some or all funds received. Failure to comply may result in ineligibility to receive future financial assistance at any institution, referral to collections agencies, and interception of income tax refunds. For more information, see the College Catalog at: [Withdrawal Policy & Procedures](#).  Students with questions should contact Enrollment Services via any of the methods mentioned above or at 774-357-2590.

## Interaction and Communication Plan

Questions regarding course readings and assignments should be posted to the discussion board on eLearning. The instructor checks the board daily and will respond to all questions within 48 hours.

The students should use email to communicate an issue of a personal and confidential matter. If the question you ask could benefit other students, post the question in the appropriate forum on the discussion board.

The instructor checks the email daily Monday through Friday during the normal business hours. You can expect a reply via email within 48 hours during the work week.

## Technology Policy

Important: Web access to this course is password-protected. You need a Login and Password to enter. The passwords ARE NOT the same as eLearning. To get your credentials, email your instructor directly:

   Igor.Kholodov@bristolcc.edu

Each student is expected to contact the instructor via official college email during the first week of class. The instructor replies with instructions to access the course website. There are no additional costs associated with the use of the course website. The student needs only internet connection and a web browser to interact with the site.

All technical support is provided by the instructor of this course. Please DO NOT contact Bristol ITS with any issues related to the forgotten passwords or technical difficulties. To get help, email your instructor directly: [Igor.Kholodov@bristolcc.edu](mailto:Igor.Kholodov@bristolcc.edu).

A desktop PC or a laptop running Windows operating system is required to complete programming assignments in this course.

## Time Considerations

Although you do not need to physically come to campus, you still need to set aside equivalent time to learn, study and interact in the online classroom. If you were going to take a 4-credit course including a 1-hour hands-on laboratory, you would come to campus for 4 hours a week and would spend an additional 8 hours a week doing reading and homework outside of the classroom. In the online environment, you will spend the same amount of time, but you will need to figure out how to structure your own learning.

For this 4 credit fully online course you should plan to spend a total of 180 hours of studying during a semester.

## Academic Dishonesty Policy

A College community must be established on a foundation of truth and academic integrity. Bristol Community College has an obligation not only to promote these high standards of academic honesty, but also to address academic dishonesty. Academic dishonesty is demonstrated by cheating, plagiarism, and facilitating academic dishonesty.

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o    **Cheating** – Includes, but is not limited to: (1) use of any unauthorized assistance in taking quizzes, tests, or examinations; (2) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; or (3) the acquisition, without permission, of tests or other academic material belonging to a member of the College faculty or staff. Cheating shall also include the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials. Taking credit for work done by another person or doing work for which another person will receive credit. Copying or purchasing others work or arranging for others to do work under a false name. (Bristol Student Handbook)

o    **Plagiarism** – Includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials. This would also include material that is obtained from the computer. (Bristol Student Handbook)

o    **Facilitating Academic Dishonesty:**  Students who allow their work to be used by other students or who otherwise aid others in academic dishonesty are violating academic integrity.

Learn more about the [Academic Dishonesty Policy](#).

## Course Contribution Confidentiality Policy

Students are encouraged to contribute personal experiences to correlating the course material in discussion forum. It is an excellent way to learn new material. Therefore, confidentiality of these contributions must be guaranteed to all students equally to provide a safe and supportive learning environment. No student should ever repeat, forward, or otherwise communicate another students' personal experiences or allow people outside the class to access our password protected course site or read printed versions of any student's posts. Violation of this policy may result in removal from the course and/or a Failing grade. For further protection, please be sure to post and discuss only information you would not mind being made public in the event anyone violates this confidentiality rule.

## Title IX Statement

**Protecting Your Privacy while Protecting You: Your Work and Words in this Course.**  Bristol Community College is committed to a policy of affirmative action, equal employment and educational opportunities, non-discrimination, and diversity. The law prohibits discrimination based on race, color, sex/gender, national origin, disability, religion, age, sexual orientation, gender identity or expression, genetic information, and veteran status.

As a student at Bristol Community College, this policy applies to you, which means that any faculty member who receives information which they believe may involve a violation of this policy is required to report it to our Diversity & Title IX Officer. Please know all work and discussions completed for this course will be kept private to the extent possible, but where a violation of policy may have occurred, reports to the Diversity & Title IX Officer will occur and may include any and all forms of communications, including written work.

## Disability Accommodations

If you are a student who would normally seek accommodations in a traditional, face to face classroom, please speak to me and the Office of Disability Services (ODS) as soon as possible. You may contact the Office of Disability Services to arrange for appropriate accommodations by calling (508) 678-2811 (Fall River, ext. 2955; Attleboro, ext. 2996; New Bedford, ext. 4011) or by stopping by L109. You may also contact the Office of Disability Services online at [Disability services.](#)

## Additional Resources

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**eLearning discussion forum**: Log in into Bristol eLearning website to participate in the forum. If you require technical assistance or have questions please contact the eLearning help desk at 774-357-2081 or send an email to elearning@bristolcc.edu.

**Online Learning Help**: If you are experiencing technical issues with eLearning discussion board, please fill out the

Bristol Online Help Request

**The Learning Commons** is the Central hub for tutoring at Bristol Community College. The *Learning Commons* encompasses both the Tutoring and Academic Support Center and the Writing Center. If you are struggling with a class, paper, or want to hone your educational abilities, the *Learning Commons* can help you reach your goals. Our tutors can teach you the skills and give you the confidence to become the best student you can be, regardless of your level of learning. For current hours and more information please contact your campus location using the information below or visit Learning Commons.

**eTutoring:**

Students can receive real-time online tutoring 24 hours a day, 7 days a week in various subjects, and can upload essays or other writing assignments and receive feedback within 24 hours through the **ThinkingStorm eTutoring** service. Click here to get connected to all your tutoring options (1:1 appointment, online drop-in & email paper review).

**Library Services:**

Students at all campuses and those participating in online courses have access to the library's physical print and electronic resources and the Statewide Virtual Catalog. The library offers in-person and online instruction on the use of library resources and basic information literacy competency skills. Students are encouraged to physically visit the library, use the library website to access resources, or connect virtually with a librarian through the Ask a Librarian service.

**NEED HELP OR SUPPORT?**

If you feel overwhelmed and need help or support at any time, please know that Bristol faculty & staff are here for you and we can address your needs or refer you to the appropriate resources necessary! While we always encourage students to seek assistance from their instructor for academic challenges, for other concerns, or if they are not available, we recommend you reach out to the Advising Center digitally by visiting Advising or by emailing advisingcenter@bristolcc.edu .

## College's Affirmative Action Policy

Student work – papers or other assignments – are not "confidential." That is, should a student express something in writing (or other form) in your class which points to sexual assault/harassment, discrimination, or dangerous mental instability, you should immediately alert someone. All mentions of sexual assault/harassment or discrimination should be reported to me or HR. All other matters can be reported to me, campus police, HR, the Student Conduct Officer, or Counseling Services.

 The College's Affirmative Action Policy provides as follows:

 g. Duty to Report

**No member of the College community who receives a complaint of discrimination, discriminatory harassment or retaliation can ignore it**; he or she should give to the person making the complaint as much assistance in bringing it to the attention of the Affirmative Action Officer or Title IX Coordinator as is reasonably appropriate given his or her position at the College and relationship with the person making the complaint. **Any trustee, administrator, department chair, program coordinator, manager or supervisor who receives a complaint of discrimination, discriminatory harassment or retaliation from a student or other member of the College community is obligated to report** the complaint to the Affirmative Action Officer as soon as he or she becomes aware of it**. In the case of claims of sexual harassment** or sexual violence, reports shall be made to the Title IX Coordinator. Any investigation of such allegations shall be conducted by the College's Affirmative Action Officer and/or the Title IX Coordinator. **Similarly, all students, faculty, staff, administrators, and others having dealings with the institution are encouraged to report to the Affirmative Action Officer or the Title IX Coordinator** any conduct of which they have direct knowledge and which they

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in good faith believe constitutes discrimination, discriminatory harassment or retaliation in violation of this Policy. Any member of the College community who has a question about his or her responsibilities under this policy should contact the Affirmative Action Officer.

This means that if a student reports any of the above to a faculty member, the school will be responsible for investigating and acting. All that is required is that the employee let us know who has reported something so that we may follow up with that person.

## Tentative Course Schedule

1. Number systems, Bits, Data Types, and Operations
   Lab L01: Binary Arithmetic and Conversion
   Assignment A01: Binary Data Representation

2. Digital Logic Structures
   Lab L02: Using Digital Works
   Assignment A02: Binary Storage and Conversion

3. Memory and Sequential Logic Circuits
   Lab L03: Two's Complement Adder/Subtractor
   Assignment A03: Digital Logic Structures

4. The Von Neumann Model
   Lab L04: Overflow Detector
   Assignment A04: The von Neumann Computer Model

5. Introduction to x86 Assembly Language
   Lab L05: Design of a 4-bit Magnitude Comparator
   Assignment A05: First x86 Assembly Program

6. Instruction Set Architecture Design

7. Language Components of MASM
   Lab M07: x86 Opcode Analysis

8. Data Types and Memory Allocation
   Lab M08: Console Input/Output

9. Controlling Program Flow
   Lab M09: Data Arrays, Windows API Calls

10. x86 Memory, CPU Flags, and Data Manipulation
    Lab M10: Integer Arithmetic Part 1: High-speed Multiplication by Powers of 2

11. Memory Protection, Paging, and Memory Model Directives
    Lab M11: Integer Arithmetic Part 2: Extended Precision Techniques

12. Instruction Operand Addressing on x86
    Lab M12: Assembly and C standard library functions

13. The Program Stack and Procedures
    Final Project Overview

14. Final Project Overview, conclusion

**Note**: *This syllabus is a suggested course outline and will be generally followed, subject to change according to the instructor's discretion and needs. Academic flexibility is important*