

**Nashville State Community College**  
**Science, Technology, Engineering, and Mathematics (STEM) Division**  
**Computer Information Technology**  
**Master Course Syllabus**

**CISP 2410 Assembly & Computer Organization**

This syllabus sets forth the expectations for course content, work, and grading as well as expectations for student performance and conduct. The syllabus does not constitute a contract between the student and the instructor or the College. The information contained here is subject to change at any time. Students will be notified if any changes are made. Though changes are possible, it is expected that the course will be conducted as described in this syllabus.

**Course Information:**

Course Title: CISP-2410 Assembly & Computer Organization

Credits: 4

Class Hours: 4 Class

**Course Description:**

This course is a study of computer organization and Assembly language. Topics include number systems, Boolean algebra, combinational and sequential circuits, processor functional units and control, pipelining, memory and caching, stored program computing, memory management, computer system organization, assembly language programming.

**Prerequisite(s): CISP 1010**

**Instructor Information:**

Name:

Office:

Phone:

Email:

Office Hours:

**Required Textbook(s) & Other Materials:**

Textbook(s): The Essentials of Computer Organization and Architecture

Linda Null and Julia Lobur, Jones and Bartlett.

ISBN: 978-1-44960-006-8, 3<sup>rd</sup> edition

or

ISBN: 978-1-28404-561-1, 4<sup>th</sup> edition

Once enrolled, all students should verify that they have the correct textbook and materials information by consulting the D2L/NS Online shell for the course. If you are registered with the Access Center and require an alternate format for the textbook and other course materials, please contact the Access Center at 615-353-3721, 615-353-3741, or [accesscenter@nsc.edu](mailto:accesscenter@nsc.edu).

**Digital Course Materials (DCM):**

To ensure the lowest cost for students, this course includes a materials fee. This means that some or all of the required textbooks and materials for this course are available through your *NS Online* course

shell. When you register for this course, the charge will appear on your account. If you decide you do not want to purchase the course materials embedded in *NS Online*, you can opt out of the program until September 6th, 2020. If you opt out, you will be responsible for obtaining the required course materials on your own.

### **Course Outcomes:**

Upon successful completion of this course, students should be able to:

- Calculate unsigned, signed and floating-point binary number values.
- Design, implement, and test the hardware for a system using a digital circuit simulator.
- Design, implement, and test assembly language programs.
- Describe and use basic ISA-level concepts such as registers and stacks memory addressing modes and ISA-level instruction types and formats.
- Explain the fetch-decode-execute cycle.
- Describe pipelining, parallel processing and calculate speedup.
- Describe the difference between physical and virtual memory addresses and calculate physical addresses.
- Describe direct memory access, the difference between polling and the difference between character and block I/O.
- Describe the compilation, assembly and linking processes.
- Explain the difference between RISC and CISC.
- Recognize and describe different parallel process.

### **Course Competencies:**

The following are detailed course competencies intended to support the course outcomes:

- Positional Numbering Systems
- Decimal to Binary Conversions
- Converting Unsigned Whole Numbers
- Converting Fractions
- Converting between Power-of-Two Radices
- Signed Integer Representation
- Signed Magnitude
- Complement Systems
- Floating-Point Representation
- Floating-Point Arithmetic
- Error Detection and Correction
- Cyclic Redundancy Check
- Hamming Codes
- Reed-Soloman
- Boolean Expressions
- Boolean Identities
- Simplification of Boolean Expressions
- Complements
- Representing Boolean Functions
- Symbols for Logic Gates
- Universal Gates
- Multiple Input Gates
- Digital Circuits and Their Relationship to Boolean Algebra
- Clocks
- Flip-Flops
- Assembler programs and projects
- Instruction sets

## **Topics to Be Covered:**

### **Chapter 1**

Provides a historical overview of computing in general, pointing out the many milestones in the development of computing systems, and allowing the reader to visualize how we arrived at the current state of computing.

### **Chapter 2**

Provides thorough coverage of the various means computers use to represent both numerical and character information.

1. Number bases
2. one's complement, two's complement, and BCD.
3. EBCDIC, ASCII, and Unicode character representations.
4. Fixed- and floating-point representation.
5. Codes for data recording and error detection and correction are covered briefly.

### **Chapter 3**

Is a classic presentation of digital logic and how it relates to Boolean algebra. This chapter covers both combinational and sequential logic.

### **Chapter 4**

Illustrates basic computer organization and introduces many fundamental concepts, including the fetch-decode-execute cycle, the data path, clocks and buses, register transfer notation, and of course, the CPU. A very simple architecture, MARIE, is introduced and programs are written in assembler.

### **Chapter 5**

Provides a closer look at instruction set architectures, including instruction formats, instruction types, and addressing modes. Instruction-level pipelining is introduced as well.

### **Chapter 6**

Covers basic memory concepts, such as RAM and the various memory devices, and also addresses the more advanced concepts of the memory hierarchy, including cache memory and virtual memory.

### **Chapter 7**

Provides a detailed overview of I/O fundamentals, bus communication and protocols.

### **Chapter 8**

Discusses the various programming tools available (such as compilers and assemblers) and their relationship to the architecture of the machine on which they are run.

### **Chapter 9**

Provides an overview of alternative architectures that have emerged in recent years. RISC, Flynn's Taxonomy, parallel processors, instruction-level parallelism, multiprocessors, interconnection networks, shared memory systems, cache coherence, memory models, superscalar machines, neural networks, systolic architectures, dataflow computers, and distributed architectures are covered.

### **Chapter 10**

Addresses various performance analysis and management issues.

### **Chapter 11**

Focuses on network organization and architecture, including network components and protocols.

## **Course Assessments:**

The following performance assessments will be used to demonstrate students' understanding, knowledge, and skills:

### **Homework**

#### **Chapter 02**

- Positional Numbering Systems
- Decimal to Binary Conversions
- Converting Unsigned Whole Numbers
- Converting Fractions
- Converting between Power-of-Two Radices
- Signed Integer Representation

- Signed Magnitude
- Complement Systems
- Floating-Point Representation
- Floating-Point Arithmetic
- Error Detection and Correction
- Cyclic Redundancy Check
- Hamming Codes
- Reed-Soloman

### **Chapter03**

- Boolean Expressions
- Boolean Identities
- Simplification of Boolean Expressions
- Complements
- Representing Boolean Functions
- Symbols for Logic Gates
- Universal Gates
- Multiple Input Gates
- Digital Circuits and Their Relationship to Boolean Algebra
- Clocks
- Flip-Flops

### **Chapter04**

- 8 assembler programs
- 3 assembler projects

### **Chapter05**

- Instruction sets

## **Tests and Quizzes**

### **Chapter02**

- Positional Numbering Systems
- Decimal to Binary Conversions
- Converting Unsigned Whole Numbers
- Converting Fractions
- Converting between Power-of-Two Radices
- Signed Integer Representation
- Signed Magnitude
- Complement Systems
- Floating-Point Representation
- Floating-Point Arithmetic
- Error Detection and Correction
- Hamming Codes

### **Chapter03**

- Boolean Expressions
- Boolean Identities
- Simplification of Boolean Expressions
- Complements
- Representing Boolean Functions
- Symbols for Logic Gates
- Digital Circuits and Their Relationship to Boolean Algebra
- Flip-Flops

### **Chapter04**

- four assembler programs

**Chapter05**

- instruction sets

**Chapter06**

- memory

**Chapter07**

- input/output and storage

**Chapter08**

- system software

**Chapter09**

- other architecture

**Chapter10**

- performance

**Chapter11**

- networks

**Late Work Policy & Make-up Procedures for Missed Assignments and Work:**

- All programming exercises will have an assigned deadline
- No points are given for small assembler programs turned in after the assigned deadline.
- Projects will have 3 due dates. 100%, 80% and 60%
- Make up quizzes can be given if a student misses a quiz and informs the instructor within a week of the quiz date

**Grading Policy:**

Requirements to pass the course:

- All homework assignments will have an assigned deadline
- All tests and quizzes are closed book, notes, internet, etc. (see Academic Dishonesty)

**Grading Scale:**

- Your grade is calculated by adding all points earned in small programs, projects, tests, quizzes and attendance and dividing that total by the total number of possible points
- Grades will be determined as follows (**Average = Total points earned / Total points**):

Letter Grade	Percentage Range	Points
<b>A</b>	89.5 - 100.0	
<b>B</b>	79.5 - 89.4	
<b>C</b>	69.5 - 79.4	
<b>D</b>	59.5 - 69.4	
<b>F</b>	< 59.5	

**FA Grade:**

According to NSCC policy, an FA is awarded to students who do not officially withdraw from a course and do not attend after the cut-off date provided in the academic calendar. Please refer to the current academic calendar available on the Nashville State web site, look for the date that indicates it is the "Last Day to Earn F for Attendance (FA)." Students who stop attending on or before this date receive an FA; students who stop attending after this date receive an F. This date is (***insert date here***).

For online courses, attendance is defined by submission of assignments. Students who fail a course and whose last assignment is submitted on or before the FA date will earn an FA for the course. Students who fail a course and whose last assignment is submitted after the FA date will earn an F for the course. An FN is assigned to students who do not submit any assignments.

**FN Grade:**

An FN is awarded to students who never attended class.

**W Grade:**

The last day to withdraw from a course with a W is (insert date here).

**Attendance Policy**

The College is not an attendance taking institution as defined by 34 CFR 668.22(b)(1) in the Code of Federal Regulations; however, students are expected to attend all scheduled classes and laboratories.

- Absences in a course may affect a student's final grade.
- Tardiness may also affect a student's final grade.
- Students are responsible for all work/tests that occur during any missed class session(s) regardless of reason(s) for absence.
- Students who are sick or not well enough to attend class must notify the instructor as soon as possible before the scheduled class time, unless incapacitated or unable to do so. In that case, students must contact the instructor as soon as reasonably possible.
- If a student has an unavoidable conflict with a scheduled class session, students must notify the instructor, preferably before the class session, or as soon as possible.

For purposes of financial aid continued attendance is determined via engagement in the course. This can be accomplished in several ways including, but not limited to, continued attendance and/or participation in on-ground class sessions, participating in D2L as prompted (e.g., responding to an instructor's email, posting to a discussion board), and/or completing and submitting assignments.)

To the extent that attendance is kept in this class it is not for the purpose of the College but is instead associated with the instructor's individual grading rubric.

**Technology Statement**

- All classes at the College are web enhanced.
- It will be essential for students to have access to a computer and an internet connection to complete assignments, engage in online discussions, and access various course materials through D2L/NS Online course shells.
- Students may also be required to use free video conferencing platforms (ex: Zoom, Teams) for classes and meetings.
- Students will be responsible for appropriate dress while on video, to ensure a distraction free environment (mute sound as needed) and to ensure their background is neutral for others to view.
- If you have questions or concerns regarding access to a computer or internet resources, please contact your instructor. Additional information available: <https://www.nsc.edu/current-students/student-online-resources/access-to-internet-and-technology>.
- Certain publisher materials may not work on cellphones.

**Computer Labs**

Computers are available for student use at each campus during campus open hours. Open computer lab availability may vary from campus to campus.

Students should check NSCC website for current hours of operation.

**D2L/NS Online and myNSCC**

It is students' responsibility to check D2L/NS Online course shells for all enrolled courses and myNSCC, including student email, on a regular basis. These are the official communication channels between the college and students, who are responsible for the information communicated through those channels.

D2L/NS Online contains specific course information and myNSCC contains information important for other purposes.

### **ADA Compliance Statement**

Nashville State complies with the Americans with Disabilities Act (ADA). If you require accommodations for any courses in which you are enrolled, contact the Access Center at 615.353.3741 or 615.353.3721, or e-mail [accesscenter@nsc.edu](mailto:accesscenter@nsc.edu). If you are registered with the Access Center and require an alternate format for the textbook and other course materials, please contact the Access Center.

### **Classroom Misconduct**

Nashville State Community College has a zero-tolerance policy for disruptive conduct in the classroom. Students whose behavior disrupts the classroom will be subject to disciplinary measures. Please review the [Nashville State Student Code of Conduct policy](#). Please be aware that children are not allowed in class or to be left unattended on campus.

### **Academic Misconduct**

Any form of academic dishonesty, cheating, plagiarizing, or other academic misconduct is prohibited. Students are responsible for understanding and abiding by the [Academic Misconduct Policy](#) in the Nashville State Student Code of Conduct. In addition to other possible disciplinary measures that may be applied through regular college procedures as a result of academic dishonesty, the instructor has the authority to assign an "F" or a "zero" for the exercise, paper, or examination, or to assign an "F" for the course. Students may appeal through the appropriate college grade appeal procedures.

*(Each instructor will outline his/her expectations for academic integrity and provide individualized information about consequences for academic misconduct.)*

### **Academic Early Alert System**

Nashville State Community College uses an Early Alert System to let students know of a faculty member's concern in one or more of these academic areas: lack of attendance, lack of classroom participation, late or missing assignments, and/or poor performance on assignments/tests. \*Please note that Early Alerts do not affect a student's academic standing. If you receive an Early Alert email, please see your instructor and your academic advisor as soon as possible.

### **RAVE Emergency Alert System**

Emergency events can happen at any time, and Nashville State Community College wants to notify students if and when they occur. For this reason, all students have been enrolled in the free RAVE alert system. If you have not already done so, please log in at <https://www.getrave.com/login/nsc> to confirm and update your contact information and notification preferences. It is critical that your information be correct so that you will receive any emergency notifications. Your RAVE Username is your NSCC email address. If you've never received an email from RAVE with your password, or if you need to reset your password, select "Forgot your password?" and a new password will be emailed to you. Should the RAVE system indicate "user not found", select Register and create your own RAVE account.

### **Student Wellness**

The general well-being of students is an important component of their academic success. With this in mind, Nashville State Community College has several resources available to provide support when needed:

- Students with general, non-academic questions and concerns about COVID-19 may email [virusinfo@nsc.edu](mailto:virusinfo@nsc.edu).
- Five free telephone therapy sessions are available via Agape Counseling by calling 615-781-3000.
- Online tutoring is available via NetTutor within the D2L course shells.

- A comprehensive list of online student resources may be found at <https://www.nsc.edu/current-students/student-online-resources>
- A comprehensive list of student support services may be found at <https://www.nsc.edu/current-students/on-campus-resources/student-support-services>

## **Equity Statement**

Nashville State Community College has a relentless commitment to the transformation of our institution through the intentional design of college experiences that expect and promote excellence from students, faculty, staff and administration. We consider equity to be an obligation of higher education. We strive to ensure that each student receives what that student needs to be successful, with goals of success beyond the classroom. We do this through an evidence-based and collaborative effort, understanding that our student population has diverse needs that must be addressed. We recognize that this effort may not always be comfortable and that partnering with students is the driving force to overcome barriers to success.

## **Inclement Weather & Campus Closings**

Nashville State will use the RAVE alert system to send a text message to students, staff, and faculty about adjusted hours of operation and/or closings at individual campuses. All students should check the Nashville State web site home page at [www.nsc.edu](http://www.nsc.edu) for announcements on campus closures, which may vary from campus to campus. Campus closures will also be announced on local television stations. Students should use their own best judgment in determining whether to report to campus during inclement weather when classes are not cancelled.

Even when campuses are closed, students are still responsible for completing all assigned work. When classes are cancelled, faculty will post online assignments and any additional instructions in the D2L/NS Online course shell. Check D2L/NS Online for a message from your instructor regarding your online assignment requirements. Faculty have discretion over adjusting deadlines or due date for assignments, but students are responsible for completing all assigned work by the due date established by the instructor.

## **Class Cancellation Policy**

If the class is cancelled, the instructor will notify all students by posting in the D2L/NS Online course, e-mailing through D2L/NS Online, and/or by posting a sign on the classroom door. In the event of class cancellation, students must access D2L/NS Online to complete classwork and the assignment that will be posted in the course D2L site.

## **Communication Statement**

In this time of uncertainty due to COVID-19, communication between student and faculty is key. At times, situations arise for one or both that makes that communication difficult or delayed. This can include but is not limited to health issues and/or problems with technology. If you have attempted to contact your instructor, and have waited the turnaround time as outlined in the syllabus but have not yet received a response, please reach out for additional support using this survey:

<https://forms.gle/rM7rxFarksRFeA3b8>