CS 301-3 Computer Organization

Northeastern Illinois University > College of Business and Technology Syllabus > Plan A*

Spring 2026

COURSE INFORMATION

Credit Hours: 3.0

Course Description: Students will gain a vision of levels of abstraction in hardware and software, the nature of the Von Neumann machine and the nature of high level languages. The representation of data, machine arithmetic, processor and memory organizations, instruction execution, assembly and machine languages, addressing mechanisms, and implementation of high level language constructs.

Course Prerequisites: CS-200 and CS-201 with a minimum grade of C

CRN: 23628

Dates and Times*: **January 20, 2026 – May 11, 2026**
Course modules are set up by week.
The week starts on Monday and concludes on the following Sunday.

*No Classes or Office Hours:
Thursday, February 12, 2026 - Lincoln's Birthday Holiday-University Closed/No Classes
March 16 – 22, 2026 – Spring Break -University Closed/No Classes

Classroom: Online: utilizing course website, Nmail, Google Chat or D2L discussion, D2L

FACULTY INFORMATION

Instructor: Freddy Porps

Office Location: **ONLINE** via email, and Zoom links available to course registered students in D2L course shell. (I can be found to help you in many places – you are not alone) **or when on campus (CBT 128 formerly CBM building)**

Student Office Hours*: Wednesdays (W): 7:00 a.m. - 8:00 a.m. **(via Zoom)**

*No Classes or Office Hours:
Thursday, February 12, 2026 - Lincoln's Birthday Holiday-University Closed/No Classes
March 16 – 22, 2026 – Spring Break -University Closed/No Classes

Phone Extension: (773) 442-4720 **(CS Department Office) Email is the BEST way to reach me outside of class time or office hours.**

E-mail: **F-Porps@neiu.edu**

COURSE MATERIALS

List of Required Texts/Materials:

"Digital Design" by M. Morris Mano and Michael D. Ciletti, published by Pearson, 6th edition, ISBN: 978-0-13-454989-7. (hard copy) The e-book does not match up with assigned problems. We will be using portions of this textbook in the first half of the class. We will not be covering all the topics nor will we dive completely into all the material in the chapters that will be used. It is the best textbook for the material that we will cover and you should plan to keep this textbook for future reference in other courses.

Instructor Web site: **https://cs.neiu.edu/fporps/**

From the Instructor web site, click on: **CS301-3** in the navigation bar for course specific information, such as the weekly work, lecture outline, worksheets, assignments, module review, quizzes, and exam. You will find detailed specifications and due dates. You are responsible for all the material posted to this web site as related to CS 301.

The class web site is the most important resource for successful completion of this course!

Content may change during the semester; thus, it is your responsibility to read your email daily, check the course website reading the pop up box on the course home page as well as D2L Announcements at least twice weekly.

MAJOR COURSE TOPICS

- Binary, Octal, and Hexadecimal Numbers.
- Signed Binary Numbers.
- Boolean Algebra.
- Canonical and Standard Forms.
- Simplification Methods.
- Karnaugh Maps.
- Basic Computer Building Blocks: Logic Gates, Tri State Buffers.
- Combinational Circuits: Adders, Encoders, Decoders, Multiplexers.
- Sequential Circuits: Excitation Tables, Design of Registers and Counters.
- A Primitive Computer: Input and Output Ports, Bus Organization, ALU, Instruction Set, States, Timing Diagram, Machine Code Programming.
- A Microprocessor: Addressing Modes, Instruction Set, Arithmetic Operations, Logical Operations, Program Counter, Memory Address Register, Instruction Register, Sequencer, Flags, Stack, Stack Pointer - Interrupts, Assembly Language Programming.
- Simulation of logic gates, flip-flops, counters, registers and sequencer using "Logisim".
- Intel 8085 Microprocessor: Instruction set, Simulator.

COURSE OBJECTIVES / STUDENT LEARNING OUTCOMES

After successfully taking this course, a student should be able to do the following:

- Understand the basic blocks of a computer system.
- Understand the design and operation of the basic components of a computer block.
- Understand the relationship between hardware and software.
- Understand how the instructions/programs are executed.
- Understand the relationship between machine language, assembly language and high level language.
- Understand the processor and memory organizations.
- Be able to program in assembly an 8-bit processors.

STUDENT TASKS / ASSIGNMENTS / REQUIREMENTS

Assignments/Attendance (approx. 17%: 45 points): There will be homework assignments for each course module to practice the concepts covered via videos, readings and worksheets to confirm your active participation in the course.

They are **due by the end of the module on Sundays by 11:59 p.m.**
They will be scored as follows:

+ 3 pts - 100% correct
+2 pts. - At least 75% correct
+1 pt. – attempted the assignment

They are to be submitted via email unless noted otherwise. You must also show all your work either in the body of the email (preferred) or as a .pdf file attachment, as to how you arrive at the solution. Submissions with answers only will **not** receive full credit. Use the appropriate subject line for the email to receive credit for your correct submission. **The subject line format is: CS 301 > Assignment Week (week number),**
e.g. Week 1 would be: CS 301 > Assignment Week 1

Note: If you have a question about the assignment, add the "?" after the course and section number in the subject line of the email. I respond to questions ahead of assignment grading and other emails.
e.g. CS 301 > ? >Asst. Week 1 > Where do I submit my work?

Late work cannot be accepted for credit if the solution has been shared. There is a late penalty of -.5 for any late work that can be accepted for credit.

Quizzes: (approx. 63%: 160 points)

There will be 8 quizzes. Each quiz will be worth 20 points. They will take approximately 20-45 minutes, but the allowed time for each is listed in the blue quiz box on the course home page. Each quiz will be based primarily on recent material covered, but a portion of the quiz can

contain past material covered to help you to retain these important concepts as you progress through the computer science program.

Quizzes are synchronous *and will be available through D2L or emailed to you. The delivery method will be noted on the course home page. They will be* ***available starting on Monday at 12:01 a.m. and due by Tuesday at 11:59 p.m. during the week that a quiz is scheduled*** *(see course home page for schedule). Please note, each quiz will have an allowed amount of time to complete the quiz within the window of time that the quiz is available.*

Final Test: (approx. 20%: 50 points)

The final test is cumulative of all the material covered in the course.
The ***final test is synchronous*** *and will be available through D2L. It will be available on* ***Monday, 4.27.26 at 12:01 a.m. and due by Tuesday, 4.28.26 at 11:59 p.m..*** *You will be given 2 hours to complete the test once it is started.*

Grading Policies and Formulae:

Final Score (Course Grade) will be determined as follows:
A (90% +) = 230 + points
B (80-89%) = 204 to 229 points
C (70-79%) = 179 to 203 points
D (60-69%) = 153 to 178 points
F (less than 60%) = 152 points or less

Note:
If you choose to terminate participation in a class, and wish to receive a grade of withdrawn (W), the deadline to drop a course is 4.10.26 by 11:59 p.m., via NEIUport.

If you do not officially withdraw from a class, you will still receive the grade for the course.

Please email me or stop by during office hours to discuss your performance in class before making this decision.

Course Outline:

Refer to the course website for specific topics, assignment, and quiz details.

COURSE POLICIES AND STATEMENTS

Absence Policy:

Weekly Attendance is required and noted by completion of the assignment at the end of each weekly module.

Academic Integrity Policy:

By enrolling in this course, you are bound by the NEIU Student Code of Conduct: http://www.neiu.edu/university-life/student-rights-and-responsibilities/student-code-conduct. You will be informed by your instructor of any additional policy specific to your course regarding plagiarism, class disruptions, etc.

ADA Statement:

NEIU is committed to the success of all of our students. We recognize that each student brings valuable experiences and abilities to their education. NEIU faculty are ready to support you in whatever ways will allow you to achieve your goals, and this includes making sure you have access to and are able to fully engage with our course. Whatever the abilities or disabilities (both visible and invisible) you bring to the table, please know that you are welcome here and your success is our mission. Please do not hesitate to contact your instructor with any questions or concerns about your access to the course.
Northeastern Illinois University (NEIU) complies with the Americans with Disabilities Act (ADA) in making reasonable accommodations for qualified students with disabilities. Please contact Student Counseling Services (773-442-4650) and/or Student Disability Services (SDS) for help with accommodations. SDS is located in room D104 and can be contacted at (773) 442-4595 or sds@neiu.edu. Visit the website for more information: http://www.neiu.edu/university-life/student-disability-services. SDS is committed to fostering inclusion and full participation of students with disabilities in all aspects of their University experience. If you already have an accommodation letter, please send it to your instructor.

Campus Safety:
Web links to Campus Safety: Emergency Procedures and Safety Information can be found on NEIUport on the MyNEIU tab or as follows:
https://www.neiu.edu/university-life/university-police

Course Specific Policies:

- Technology and/or devices that are disruptive to the learning environment are not allowed in any meetings, i.e. put your smart phone on silent and turn off other technology.
- If you are aware of any class schedule conflicts you must email me prior to the Week 2 class meeting, with a detailed reason for the scheduling conflict.
- If something occurs that does not allow you to participate in a class module, it is your responsibility to email me and inform me of your absence **before** the start of class. In the case of an emergency, contact me at the soonest possible opportunity.
- Policies may be added or amended during the course of the semester, as deemed necessary.
- I will do my best to support you in the learning process, by being available to answer your questions during student hours, and via email.

Course Communication

I will respond to all of your emails sent from your NEIU email account.

Late Work

Sometimes we miss a deadline.
If the solution has not yet been shared with the class, I will accept your work.
Once solutions are shared with the class, there will be no make-up work.
There is a late penalty of -.5 for any late work that can be accepted for credit.
There is a -2 point penalty for make-up quizzes (emergencies are an exception for the penalty on quizzes)

Submission of Materials

Course activities and written assignments are to be submitted as noted per each assignment specifications. All work is to be typed, using the MLA heading and citations, unless otherwise noted.

Incomplete Grade Policy

An Incomplete ("I") grade is temporary and exceptional, and can be given only to students whose completed coursework has been qualitatively satisfactory but who have been unable to complete all course requirements because of illness or other circumstances beyond their control. An "I" grade is not to be awarded in place of a failing grade or when the student is expected to attend additional class meetings or to re-register to complete the course requirements. Additionally, an "I" grade is not a means for the student to raise his/her grade by doing additional work.

A request for an "I" grade must be made by the student to the faculty member before the last official day of the semester or term. The faculty member retains the right to make the final decision on granting a student's request for an "I" providing the student meets the provisions above, even though the student may meet the eligibility requirements for this grade. Students have up to one semester, excluding summer, to complete the work.

It is the responsibility of the student to complete and submit the remaining coursework before the assigned deadline. The faculty member will submit a grade change converting the "I" to a letter grade by or before the last day of the semester in which the outstanding coursework is to be completed. If the student does not meet the deadline, the "I" will be converted automatically to a final grade of an "F." Since the "I" grade is temporary, faculty may not issue a terminal "I" grade.

Upon receipt of the grade change, the Registrar Services Office will post the grade to the student's record and recalculate the GPA. Although students have up to one semester, excluding summer, to complete the work to change the grade of Incomplete, the student's academic

standing will be reassessed only if the grade change is received by the Friday of the first full week of the semester immediately following the one in which the “I” grade was assigned.

Students will not be allowed to graduate with “I” grades on their records.

Extension of an Incomplete Grade: A request to extend the assigned deadline must be put in writing to the appropriate academic dean before the assigned “I” grade becomes a failing grade. The request must provide the reason as to why a deadline extension is requested, along with including appropriate documentation (e.g. medical documentation, etc.). A letter of support from the faculty member that includes a new deadline date is also required. The Dean or his/her designate will make the appropriate decision at his/her discretion and reply in writing to the student, faculty member, and the University Registrar within 14 working days. Requests that extend beyond one calendar year from the time the incomplete grade was assigned will not be honored.

Score Worksheet and Progress Check:
It is your responsibility to keep track of your current course grade. Think of your scores as money in your "bank account" for this class. Keep accurate track of your points as you would your money. See Grading Policies and Formulae to determine your Quiz Letter Grade and Current Grade as a percentage. You may submit this completed sheet for (+3 pts. ec) during Week 9.

Activity:	Due Date:	Points Earned:	Quiz Letter Grade:	Current Grade as a %:
Quiz 1		/20 points		
Quiz 2		/20 points		
Quiz 3		/20 points		
Quiz 4		/ 20 points		
Quiz 5		/ 20 points		
Quiz 6		/ 20 points		
Quiz 7		/ 20 points		
Quiz 8		/ 20 points		
Assignments/Attendance:				
1		/3 points		
2		/3 points		
3		/3 points		
4		/3 points		
5		/3 points		
6		/3 points		
7		/3 points		
8		/3 points		
9		/3 points		
10		/3 points		
11		/3 points		
12		/3 points		
13		/3 points		
14		/3 points		
15		/3 points		
Misc. Extra Credit:				
Course Grade Before Final Test		/ 205points		
Points needed on Final Test to achieve desired grade:	Desired Grade:	Minimum Points needed for Desired Grade:	Current Points:	Points Needed:

To calculate quiz score letter grade: Divide your score by 20. Then multiply the answer by 100. This is your percentage score. Use the syllabus to determine the letter grade.

To calculate your current course grade: Add up all the points you have earned thus far for the current point in the course. Add up all the possible points you could have earned for that same time period. Divide your points by the possible points. Then multiply the answer by 100. This is your percentage score. Use the syllabus to determine the letter grade.

* The above is "Plan A," the intended protocol (rules) and structure for the course.

We will ALL need to be flexible, mindful, respectful and patient if the plan needs to be modified for any reason.

Thank you in advance for your cooperation!

I look forward to exploring the inner workings of the computer to understand how it accomplishes computing with you!

Rev 121025
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