



Self-Paced Online Courses

UNI / University of Northern Iowa.
Online & Distance Education

Course Syllabus Self-Paced Online Course (SPOC) Computer Organization CS 1410

Instructor Contact Information

Instructor	Mark Fienup
Phone	319-273-5918
Office hours and location	By appointment setup via email Location East Bartlett 39 or via Zoom: https://uni.zoom.us/j/3192735918 Zoom Password: UNI
Email Address	mark.fienup@uni.edu
Class Delivery	Online / Blackboard Learn Ultra
Preferred Communication	I will primarily communicate with students via email. Email to request an appointment by Zoom.

Course Information

Credit Hours: 3

The aggregation of time on tasks, assignments, and interactions in an online course will reflect rigor and expectations equivalent to the federal definition of the credit hour—15 hours of direct faculty instruction and a minimum of 30 hours of out-of-class student work for each credit hour awarded.

Course Description

Study of computers in terms of their major functional units. Machine representations of data, digital logic, memory, CPUs, buses, and input/output. Instruction set architectures and their implementations, addressing methods, and sequencing. Assembly language programming.

- Course prerequisite or corequisite: Introduction to Computing CS 1510
- Purpose of the course: This course provides you with an introductory understanding of how a computer system operates when it executes a program. This understanding will allow you to be a better computer

programmer and computer scientist. Similarly, good race-car drivers understand how a car operates to get good performance from their car.

Learning Objectives

University Level Outcomes:

- **Critical Thinking:** Students will demonstrate critical thinking through the ability to evaluate, analyze, and integrate information from a variety of sources in order to develop reasoned positions and solutions to problems.
- **Communication:** Students will display competence in oral, written, and visual communication, as appropriate for their discipline.
- **Program Content Knowledge:** Students will demonstrate discipline-specific knowledge and skills in their major fields of study.

Program Level Objectives:

- Students will be able to apply networking and computer system knowledge to problems involving data and process.
- Students will be able to think critically about networking and computer system problems.

Course Level Objectives:

After this course, you should understand:

- how data is represented and manipulated on the computer
- simple combinational and memory circuits used to build computer components
- how these circuits are organized to build a computer
- how to program in assembly language
- how high-level language programming languages are implemented with respect to the run-time stack and built-in data structures such as arrays and records
- general concepts of hardware support necessary for an operating system

Course Content Requirements

Required Text:

The Essentials of Computer Organization and Architecture, Author: Null,
Publisher: Jones & Bartlett Learning, Edition: 6, Year Published: 2024
ISBN 9781284259438 or Advantage Access ebook: ISBN:9781284259452

Required Reading Instructor Created Supplements on Blackboard:

- Memory Supplement with Unit 1 on Blackboard
- MARIE AL Guide with Unit 2 on Blackboard
- MARIE AL Supplement with Unit 2 on Blackboard
- MARIE Control Unit Supplement with Unit 2 on Blackboard
- MIPS Assembly Language Guide with Unit 3 on Blackboard
- MIPS Array Supplement with Unit 3 on Blackboard
- MIPS Functions Supplement with Unit 3 on Blackboard
- Hardware Support for the OS Supplement with Unit 3 on Blackboard
- Cache and Virtual Memory Supplement with Unit 3 on Blackboard

Free Software Tools:

- You need to have Java installed before running either of the below simulators needed for the course. Java is available at:

<https://www.oracle.com/in/java/technologies/downloads/>

- MARIE Simulator: MarieSim.jar available with Unit 2 Homework #5 Description and Submission Link
- MIPS Simulator MARS: available at:

<https://courses.missouristate.edu/kenvollmar/mars/download.htm>

Instructional Methods

This Self-Paced Online Course (SPOC) is designed to achieve the same learning outcomes as the traditional semester-based course. Even though you have 9 months to complete the SPOC course, you should start immediately after enrolling and set aside time to make weekly progress toward completion.

This course consists of the following activities and assessments to assist you in achieving the course and instructional units' objectives. For each unit you will complete various combinations of readings, online quizzes, and homework assignments in preparation of an exam. Additionally, optional supplemental videos from the instructor's face-to-face class are included with each unit and might aid in learning the material.

Required Instructor and Learner Interactions:

In the Start Here folder on Blackboard, please read the Meet Your Instructor and Getting Started text to learn a bit about your instructor. Plus, complete the Get to Know You survey so the instructor can learn a little about you. Of course, you can always email questions, or email to arrange a Zoom meeting with your instructor.

Readings:

Readings are an independent means of providing concrete experience to prepare you for each quiz and homework assignment. You are expected to carefully read and take the time to reflect upon the assigned readings. In addition to optional supplemental videos from the instructor's face-to-face class are optional supplemental worksheets (e.g., Lecture 1 Questions (.docx)) that might aid in learning the material from the readings.

Quizzes:

There will be a quiz on each assigned reading that counting toward your final grade. Quizzes are taken online and generally True/False and Multiple Choice.

Homework Assignments:

There will be a homework assignment on each assigned reading that counting toward your final grade. Homework assignments are more in-depth than quizzes and expect you to answer questions, synthesize reading knowledge to solve problems, write assembly language programs, etc.

Exams:

Each unit will conclude with an exam with multiple questions similar to the homework assignments. The exams are open book and notes, and you will have 2.5 hours to complete each exam. Please review UNI's policies on Academic Honesty and my own policies on using AI in this course. You must complete all of a unit's work before you can access the exam link.

Course Schedule:

Unit	Chapter	Topics	Online Quiz	Homework Assignment
1	1	Introduction – Computer History and Computer Components	Quiz 0	Homework #1
	2	2.1 – 2.3 Unsigned binary and hexadecimal #s	Quiz 1	
		2.4 Signed Integer Representation & Booth's Algorithm	Quiz 2	
		2.5 – 2.6 Floating-Point and Character Representations		
		2.7 Error Detection and Correction		
	3	3.1 – 3.4 Boolean Algebra, Logical Gates, and K-maps	Quiz 3	Homework #3
		3.5 – 3.6 Digital Components and Combinational Circuits		
		3.7 Sequential Circuits	Quiz 4	Homework #4
		Memory Supplement with Unit 1 on Blackboard		
	Mid-term exam 1 covering Chapters 1, 2, 3, and Memory Supplement			
2	4	4.1 – 4.7 MARIE Simple Computer Architecture	Quiz 5	Homework #5
		4.8 – 4.9 MARIE Instruction Processing and Programing		
		4.10 – 4.11 Assemblers and Extending MARIE Instr. Set		
		MARIE AL Guide and MARIE AL Supplement with Unit 2 on Blackboard Learn Ultra		
		4.12 Hardwired vs. Microprogrammed Control Unit	Quiz 6	Homework #6
		MARIE Control Unit Supplement with Unit 2 on Blackboard Learn Ultra		
	Mid-term exam 2 covering Chapters 4, MARIE AL Guide, MARIE AL Supplement, and MARIE Control Unit Supplement			
3	4.13.2 and 5.6.2	4.13.2 MIPS Architecture, 5.6.2 MIPS, MIPS Assembly Language Guide, and MIPS Array Supplement with Unit 3 on Blackboard	Quiz 7	Homework #7
		MIPS Functions Supplement with Unit 3 on Blackboard	Quiz 8	Homework #8
	6 and 7	Chapter 6 and Chapter 7 sections 7.1 to 7.4, Hardware Support for the OS Supplement and Cache and Virtual Memory Supplement with Unit 3 on Blackboard	Quiz 9	Homework #9
	Final exam: comprehensive, but focusing on details of Unit 3			

Evaluation Methods

Quizzes are graded automatically with scores available immediately after submission.
Homework assignments and exams scores are manually graded by your instructor, but are general available with 2 days from submissions.

Course components are weighted as:

Quizzes:	10%
Homework Assignments:	25%
Mid-term exam 1:	20%
Mid-term exam 2:	20%
Final Exam:	25%

Determination of Grades:

Course grades will be assigned based on the following grading scale:

100-90 A

89 - 80 B

79 - 70 C

69 - 60 D

Below 59 F

Plus and minus grades will be assigned for scores within two percentage points from a grade cutoff (e.g., 91.9 to 90 is an A-, and 89.9 to 88 is a B+)

Important UNI Policies and Statements

Academic Integrity:

To ensure academic integrity and to follow [UNI policies on Student Academic Ethics](https://policies.uni.edu/301) (see: IV. Academic Ethics Violations), students will not plagiarize, misrepresent, fabricate, or cheat. Unless otherwise instructed and approved by the instructor, students will take quizzes and exams **individually**, without collaboration with other parties and/or using notes or other texts. Similarly, students will submit work (papers, presentations, and other assessments) that is their own work (in regard to violations of these ethics policies, see: V. Academic Ethics Sanctions). (<https://policies.uni.edu/301>).

Artificial Intelligence (AI) Tools:

AI is rapidly changing the face of academics and software engineering. Artificial Intelligence tools (e.g. ChatGPT and Bard) can generate full (assembly-language) programs or answers to homework questions. These tools hold great promise to increase your future productivity as a computer scientist/programmer, but only if you are a proficient enough computer scientist/programmer to assess the correctness and quality of answers/code that the AI produces.

To achieve computer system understanding or assembly-language programming proficiency, you need to put in the practice. You will not get any better by having an AI tool write you an answer or code. Thus, in this course you must generate all of your own answers/code for exams and homework assignments without the use of AI.

Free Speech Syllabus Statement:

As per the Board of Regents - State of Iowa, the Syllabus Free Speech Statement will be reviewed at the beginning of each course. (Approved by UNI Faculty Senate: April 26, 2021)

The University of Northern Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We encourage the free and responsible exchange of diverse ideas on our campus. The University is committed to open inquiry and the spirited and thoughtful debate of such ideas.

Discrimination, Harassment, and Sexual Misconduct Policy:

The University is committed to achieving fairness and equity in all aspects of the educational enterprise and therefore prohibits discrimination, harassment, sexual misconduct, and retaliation under this policy. This policy applies regardless of the status of the parties involved and includes students, student organizations, visitors, faculty, administrators, and staff. [Discrimination, Harassment, and Sexual Misconduct Policy webpage](https://policies.uni.edu/1302) (<https://policies.uni.edu/1302>).

If you are aware of or witness discrimination, harassment, sexual misconduct, or retaliation **report the incident** to the Title IX Coordinator or designee in accordance with [Policy 13.02](https://policies.uni.edu/sites/default/files/13.02.pdf).

(<https://policies.uni.edu/sites/default/files/13.02.pdf>) Refer to safety.uni.edu ([https://safety.uni.edu/](https://safety.uni.edu)) for additional information on resources and reporting options, including online reporting. Please take the time to acquaint yourself with your **mandatory reporting responsibilities**. Reporting does not launch an investigation but rather allows us to provide resources and options, such as advocacy services. Riverview Center serves as our primary provider of **advocacy services** for survivors of sexual assault and has an on-campus presence.

For those looking for sexual assault **prevention activities**, including classroom speakers and presentations for student organizations, please call OCEM at 3.2846, or email <mailto:equity@uni.edu> and we will be glad to make arrangements for you.

Our online educational program related to this policy is available at training.uni.edu. Sign in with your CAT ID and passphrase to view the specific training program(s) assigned to you. It is recommended that you complete the online training or attend an OCEM-sponsored training at least once every other year. You will receive an email to alert you of assigned programs.

Non-discrimination in Employment or Education:

Content in this class has the potential to be disturbing to some individuals based on life experiences. If you ever feel the need to step out of the classroom or decline participation in an activity, please request an alternative learning experience.

UNI Policy 13.02 Discrimination, Harassment, and Sexual Misconduct states: "The University is committed to providing a workplace and educational environment, as well as other benefits, programs, and activities, that are free

from discrimination and harassment based on a protected class, as well as retaliation."

Policy 13.02 outlines prohibited conduct and reporting processes. All University employees who are aware of or witness discrimination, harassment, sexual misconduct, or retaliation are required to promptly report to the Title IX Officer or Title IX Deputy Coordinator.

If you or someone you know has been harassed or assaulted, you can find the appropriate resources at safety.uni.edu and equity.uni.edu. Resources that provide free, confidential counseling are also detailed at safety.uni.edu.

For additional information, contact the Office of Compliance and Equity Management, 117 Gilchrist Hall, 273-2846, equity@uni.edu.

Equal Opportunity and Non-Discrimination Statement:

The United States Department of Education's Office for Civil Rights (OCR) requires that a notice of nondiscrimination be prominently displayed in any **publications used in connection with the recruitment** of students or employees. Please note that this applies to electronic formats as well. Refer to the policy to view the University's approved statement. [Equal Opportunity and Non-Discrimination Statement](https://policies.uni.edu/1303) webpage (<https://policies.uni.edu/1303>).

Accommodations of Disabilities Policy:

No qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the University, or be subjected to unlawful discrimination by the University. This policy applies to all aspects of campus activities including employment, education, student programming, and services provided to the community at large. [Accommodations of Disabilities Policy](https://policies.uni.edu/1315) webpage (<https://policies.uni.edu/1315>).

Student Accessibility Services:

The University of Northern Iowa (UNI) complies with the Americans with Disabilities Act Amendments Act of 2008 (ADAAA), Section 504 of the Rehabilitation Act of 1973, the Fair Housing Act, and other applicable federal and state laws and regulations that prohibit discrimination on the basis of disability. Students with disabilities experiencing a barrier to access should connect with Student Accessibility Services (SAS) to request accommodations. SAS views disabilities as an integral part of the rich diversity at UNI and works collaboratively with students, faculty, and staff to create an accessible educational environment for students. UNI faculty are not obligated to provide accommodations for students with disabilities without proper notification from SAS and the student. Students may initiate the accommodation process at any time. However, accommodations are not retroactive, and the process of getting

connected takes time. Therefore, SAS staff always recommends that students initiate the process as soon as possible rather than wait for academic and social-emotional responsibilities to become overly stressful and/or overwhelming. For more information about the accommodation process, please contact SAS at (319) 273-2677 Relay 711, accessibilityservices@uni.edu, or GIL 118. Additional information is also available at sas.uni.edu. (<https://sas.uni.edu/>).

Affirmative Action Policy:

The University is committed to a policy of equal opportunity in employment, retention, and advancement of employees without regard to age, color, creed, disability, gender identity, national origin, race, religion, sex, sexual orientation, veteran status, or any other basis protected by federal and/or state law, except in rare instances where sex may be a bona fide occupational requirement, and to a policy of affirmative action for protected classes. Affirmative action entails special efforts by the University community to recruit and hire protected class members throughout the University, proportionate to their availability in the relative labor market. These policies apply to all positions in the University. [Affirmative Action](https://policies.uni.edu/1301) webpage (<https://policies.uni.edu/1301>).

Office of Compliance and Equity Management:

The University of Northern Iowa does not discriminate in employment or education. Visit [13.03 Equal Opportunity & Non-Discrimination Statement](https://policies.uni.edu/1303) for additional information. (<https://policies.uni.edu/1303>).

The Learning Center @ Rod Library:

The Learning Center @ Rod Library provides free tutoring for a variety of different areas (i.e. writing, math, science, business, Spanish, college reading, and learning strategies). The Learning Center @ Rod Library is open for walk-in assistance Monday-Thursday 10am-10pm and is free of charge for all UNI students. If you are unavailable during normal tutoring hours, online tutoring is also available through Smarthinking. You will need your CATID and passphrase to gain access. Access the [Smarthinking platform](https://tlc.uni.edu/online) (<https://tlc.uni.edu/online>). For more information, go to [The Learning Center](https://tlc.uni.edu) website (<https://tlc.uni.edu>), email TheLearningCenter@uni.edu, call 319-273-6023, or visit the TLC desk located on the main floor of Rod Library.

Course Communication and Technology

Online Component:

This course is completely online utilizing Blackboard Ultra for instruction, materials, submissions, and communication. This online component can be accessed through the [UNI eLearning Suite](http://elearning.uni.edu/) (<http://elearning.uni.edu/>)

All of the handouts and information for this course will be available in Blackboard Ultra. Students are advised to check the website and their email for communication. Students are responsible for learning how to use Blackboard

Ultra for submission of assignments, taking quizzes and exams, and any other graded assessments. Blackboard Ultra tutorials are also available:

- [Blackboard Learn Help for Students Ultra Course View](https://help.blackboard.com/Learn/Student/Ultra) website
(<https://help.blackboard.com/Learn/Student/Ultra>)

Communication with Instructor:

I will primarily communicate with students via email (mark.fienup@uni.edu), but I am available to meet via appointments arranged through email. Meeting can be via:

- Zoom at <https://uni.zoom.us/j/3192735918> with Zoom password: UNI
- telephone at 1-319-273-5918, or
- face-to-face in my UNI campus office located in East Bartlett hall room 39

Generally, it will take me less than 24 hours to respond to emails, except on the weekends where it may take up to 48 hours. I will provide grading feedback on homework assignment or exam submissions online through Blackboard Learn within a couple days of their submission.

Attendance, Late Work, and Makeup Work:

See UNI [Policy on Class Attendance and Makeup Work](https://policies.uni.edu/306)
(<https://policies.uni.edu/306>)

Online Netiquette and Classroom Civility:

Because this is a fully online class, you will mostly be communicating with me and through email and other online communication. It is important to think of this communication as a formal dialogue. Be sure that in all communication you create an appropriate subject line, identify yourself, and craft professionally worded content. For example, shorthand messages from your cell phone are generally inappropriate. Always submit assignments through Blackboard and never via email.

Finally, read [Albion's Core Netiquette Rules](http://albion.com/netiquette/corerules.html) and always remember to address your professor and other students in a respectful manner.
(<http://albion.com/netiquette/corerules.html>)

Best Practices for Taking Online Exams and Quizzes in Blackboard Ultra

1. Firefox or Chrome are recommended browsers for taking quizzes and exams.
2. **IMPORTANT:** The mobile app on your phone is NOT recommended for taking quizzes or exams. Students can experience errors in their answers and can be unable to submit tests.
3. If your quiz or exam is timed, plan to take the quiz or exam in a single sitting.
4. Please use a reliable (high-speed) internet connection. An ethernet connection is preferable to a wi-fi connection.
5. If you are enrolled in a course that uses a proctored exam, separate instructions will be provided by your instructor.

- For instructors using Blackboard Learn Ultra Course View, please see [Blackboard Help Tips for taking a test \(https://youtu.be/qztOnai9GZM\)](https://youtu.be/qztOnai9GZM)

If you experience technical difficulties when taking a test or quiz, immediately notify Online & Distance Education at 319-273-7740 or by emailing the name of the course, the instructor's name, and a description of the problem to: cesp-consult@uni.edu.

Technology Requirements and Digital Literacy:

Course Specific Software Tools are Free:

- You need to have Java installed before running either of the below simulators needed for the course. Java is available at:
<https://www.oracle.com/in/java/technologies/downloads/>
- MARIE Simulator: MarieSim.jar available with Unit 2 Homework #5 Description and Submission Link
- MIPS Simulator MARS: available at:
<https://courses.missouristate.edu/kenvollmar/mars/download.htm>

General Technology Literacy:

The following information has been provided to assist you in preparing to use technology successfully in this course. You are required to have access to and the ability to use:

- Blackboard Ultra
- UNI Gmail account
- Microsoft Office (UNI offers options for [Installing Microsoft Office on a Personal Computer](https://servicehub.uni.edu/docs/display/SH/Installing+Microsoft+Office+on+a+Personal+Computer) for free for current UNI students, faculty, and staff, using their CatID)
(<https://servicehub.uni.edu/docs/display/SH/Installing+Microsoft+Office+on+a+Personal+Computer>)
- Reliable (High-speed) internet connection. An ethernet connection is preferable to a wi-fi connection
- Firefox and Chrome browsers are recommended.

The following may be required for your course:

- Zoom
- YouTube, setting videos to “unlisted” in order to share links
- Panopto (Viewing and/or student submission)
- Google Drive and Google Apps (these are free with your UNI email account)
- Reliable equipment for video recording and storing recorded videos

Blackboard Ultra Support for Online Courses:

If you experience any technical problems with Blackboard or any tools used in Blackboard, please contact **Online & Distance Education** at 319-273-7740 (local), 800-772-1746 (toll-free) or cesp-consult@uni.edu. Course support is available Monday - Friday from 8:00 a.m. - 4:30 p.m.

Please note: When you contact the Division of Online Education and Individual Studies, **please provide the following so we may assist you with more speed and accuracy:**

1. name of your instructor
2. course name and number (i.e. MATH 1110)
3. section number.
4. You may also include the name of the assignment or test for which you need assistance.

For assistance with IBM SPSS or Citrix, please visit [Service Hub](https://servicehub.uni.edu/?format=portal) to request technology help or services and type in “SPSS” or “Citrix” (<https://servicehub.uni.edu/?format=portal>)