Compiled & Shared By: ✨ Hassan Sardar Naveed

👨‍👨‍👧‍👧 “Please remember me and my family in your prayers.” 🌸

📚 Bachelor of Science in Computer Science

🎓 University of the People

📞 Contact

📧 Email: hassannaveed@my.uopeple.edu

📱 WhatsApp: https://wa.me/923022129236

🌐 GitHub: https://github.com/HassanSardarNaveed

Join UoPeople Students Community

https://chat.whatsapp.com/Kv0vstTEaMUHUrlNH9SOT4?mode=ac_t

Here you will find the syllabi and primary textbooks for all UoPeople courses. The Disclaimer for Use of the Repository can be found here.

Computer Science

CS 1104 Computer Systems

UNIVERSITY OF THE PEOPLE
The Education Revolution

CS 1104 COMPUTER SYSTEMS

Syllabus

Course Description:

This course is an introduction to computer systems. In this course, we will begin by exploring the internal design and functionality of the most basic computer components. From there, we will use an online hardware simulator to actually "build" a computer and develop an assembler from the ground using concepts we will learn in the class. In the process, we will cover the ideas and techniques used in the design of modern computer hardware and discuss major trade-offs involved in system design as well as future trends in computer architecture and how those trends might affect tomorrow's computers.

Required Textbook and Materials:

UoPeople courses use open educational resources (OER) and other materials specifically donated to the University with free permissions for educational use. Therefore, students are not required to purchase any textbooks or sign up for any websites that have a cost associated with them. The main required textbooks for this course are listed below and can be readily accessed using the provided links. There may be additional required/recommended readings, supplemental materials, or other resources and websites necessary for lessons; these will be provided for you in the course's General Information and Forums area, and throughout the term via the weekly course Unit areas and the Learning Guides.

- Tarnoff, D. (2007). *Computer organization and design fundamentals*. http://faculty.etsu.edu/tarnoff/138292/. Text used with permission of the author.
- Nisan, N., & Schocken, S. (2005). *The elements of computing systems.* MIT Press. http://f.javier.io/rep/books/The%20Elements%20of%20Computing%20Systems.pdf

For each unit, the relevant chapters of the textbook will be accessible from the unit Learning Guide and from the unit section of the course homepage.

Software Requirements/Installation

This course will require the use of two software packages. Both require that your computer have a Java v1.5 JRE (Java Run Time) installed. They are available from the following:

Logism: Logism is an educational tool for designing and simulating digital logic circuits. It is available from: Burch, C. (2005). *Getting Logism*. Logism. http://www.cburch.com/logisim/download.html

TECS Software Suite: The TECS Software suite is the companion software to the Nisan and Schocken text "The Elements of Computing Systems" it is available from: Schocken, S., & Nisan, N. (2017). *Software*. From Nand to Tetris. http://www.nand2tetris.org/software.pl

Learning Objectives and Outcomes:

By the end of this course students will be able to:

1. Understand principles of digital circuits and logic
2. Explain boolean algebra
3. Identify logic gains combinatorially and sequentially
4. Describe basic principles of memory and the ALU within a computer system
5. Recognize the relationship between machine language and the functioning of a computer system
6. Examine basic assembler coding technique
7. Understand software hierarchy

Course Schedule and Topics:

This course will cover the following topics in eight learning sessions, with one Unit per week. The Final Exam will take place during Week/Unit 9 (UoPeople time).

Week 1 Unit 1- Boolean Logic
Week 2 Unit 2- Binary Arithmetic
Week 3 Unit 3- Combinational Logic and the ALU
Week 4 Unit 4- Sequential Logic
Week 5 Unit 5- Computer Architecture
Week 6 Unit 6- Machine Language
Week 7 Unit 7- Assembler I
Week 8 Unit 8- Assembler II
Week 9 Unit 9- Course Review and Final Exam

Learning Guide:

The following is an outline of how this course will be conducted, with suggested best practices for students**.**

Unit 1 : Boolean Logic

- Read the Learning Guide
- Complete Reading Assignments
- Participate in the Discussion Forum (Post, Comment and Rate)
- Make entries to the Learning Journal
- Complete Exercise
- Watch Optional Video Lectures
- Take the Self- Quiz

Unit 2: Binary Arithmetic

- Read the Learning Guide
- Complete Reading Assignments
- Participate in the discussion forum (Post, Comment and Rate)
- Watch Optional Video Lectures
- Complete and submit Unit 2 Assignment
- Make entries to the Learning Journal
- Take the Self- Quiz

Unit 3: Combination Logic and the ALU

- Peer-Assess Unit 2 Assignment
- Read the Learning Guide
- Complete Reading Assignments
- Participate in the discussion forum (Post, Comment and Rate)
- Watch Optional Video Lectures

- Complete and submit Unit 3 Assignment
- Make entries to the Learning Journal
- Take the Graded Quiz

Unit 4: Sequential Logic

- Peer-Assess Unit 3 Assignment
- Read the Learning Guide
- Complete Reading Assignments
- Participate in the discussion forum (Post, Comment and Rate)
- Complete and submit Unit 4 Assignment
- Watch the Optional Video Lectures
- Make entries to the Learning Journal
- Take the Self-Quiz

Unit 5: Computer Architecture

- Peer-Assess Unit 4 Assignment
- Read the Learning Guide
- Complete Reading Assignments
- Participate in the discussion forum (Post, Comment and Rate)
- Complete and submit Unit 5 Assignment
- Watch the Optional Video Lectures
- Make entries to the Learning Journal
- Take the Self- Quiz

Unit 6: Machine Language

- Peer-Assess Unit 5 Assignment
- Read the Learning Guide
- Complete Reading Assignments
- Participate in the discussion forum (Post, Comment and Rate)
- Complete and submit Unit 6 Assignment
- Watch the Optional Video Lectures
- Make entries to the Learning Journal
- Take the Graded Quiz

Unit 7: Assembler I

- Peer-Assess Unit 6 Assignment
- Read the Learning Guide
- Complete Reading Assignments
- Participate in the discussion forum (Post, Comment and Rate)
- Complete and submit Unit 7 assignments
- Watch the Optional Video Lectures
- Make entries to the Learning Journal
- Take the Self- Quiz

Unit 8: Assembler II

- Peer-Assess Unit 7 Assignment
- Read the Learning Guide
- Complete Reading Assignments
- Participate in the discussion forum (Post, Comment and Rate)
- Make entries to the Learning Journal
  Take the Self- Quiz
- Read the Unit 9 Learning Guide carefully for instructions on the Final Exam
- Take the Review Quiz

Unit 9: Course Review and Final Exam

- Read the Learning Guide and take the Review Quiz, if you haven't already done so
- Prepare for, take, and submit the Final Exam
- The Final Exam will take place during the Thursday and Sunday of Week/Unit 9 (UoPeople time); exact dates, times, and other details will be provided accordingly by your instructor

---

Course Requirements

Assignments and Assessment Forms

Some units in this course require that you complete a Written Assignment. You are required to submit your assignments by the indicated deadlines and, in addition, to peer assess three (3) of your classmates' assignments according to the instructions found in the Assessment Form, which is provided to you during the following week. During this peer assessment period, you are expected to provide details in the feedback section of the Assessment Form, indicating why you awarded the grade that you did to your peer. Failure to submit Written Assignments and/or Assessment Forms may result in failure of the course.

Discussion Assignments and Response Posts/Ratings

Some units in this course require that you complete a Discussion Assignment. You are required to develop and post a substantive response to the Discussion Assignment in the Discussion Forum. A substantive response is one that fully answers the question that has been posed by the instructor. In addition, you must extend the discussion by responding to at least three (3) of your peers' postings in the Discussion Forum and by rating their posts. Instructions for proper posting and rating are provided inside the Discussion Forum for each week. Discussion Forums are only active for each current and relevant learning week, so it is not possible to contribute to the forum once the learning week has come to an end. Failure to participate in the Discussion Assignment by posting in the Discussion Forum and responding to peers as required may result in failure of the course.

Learning Journal

Your instructor may choose to assign specific topics and/or relevant questions as a weekly Learning Journal entry for you to complete, but you are still encouraged to also use it to document your activities, record questions/problems you may have encountered, reflect on the learning process, and draft answers for other course assignments. The Learning Journal must be updated on a weekly basis because its entries will be assessed by your instructor directly as a part of your final grade. The Learning Journal will only be seen by your instructor.

Quizzes

This course will contain three types of quizzes – the Self-Quiz, the Graded Quiz, and the Review Quiz. These quizzes may contain multiple-choice, true/false, or short answer questions. The results of the Self-Quiz will not count towards your final grade. However, it is highly recommended that you complete the Self-Quiz to ensure that you have adequately understood the course materials. Along with the Reading Assignments, the results of the Self-Quiz should be used as part of an iterative learning process, to thoroughly cover and test your understanding of course material. You should use the results of your Self-Quiz as a guide to go back and review relevant sections of the Reading Assignments. Likewise, the Review Quiz will not count towards your final grade, but should also be used to assist you in a comprehensive review and full understanding of all course material, in preparation for your Final Exam. Lastly, the results of the Graded Quiz will count towards your final grade.

Final Exam

The Final Exam will take place during the Thursday and Sunday of Week/Unit 9, following the completion of eight units of work. The format of the Final Exam is similar to that of the quizzes and may contain a combination of different question types. You will have one attempt to take the exam, and it will be graded electronically. Specific instructions on how to prepare for and take the Final Exam will be provided during Week 8 (located inside the Unit 9 Learning Guide). Final Exams must be taken without the use of course learning materials (both those inside and outside the course). If particular materials are allowed for use during the exam, these will be noted in the exam's instructions.

Course Forum

The Course Forum is the place to raise issues and questions relating to the course. It is regularly monitored by the instructors and is a good place to meet fellow students taking the same course. While it is not required to participate in the Course Forum, it is highly recommended.

Course Policies:

Grading Components and Weights

Each graded component of the course will contribute some percentage to the final grading scale, as indicated here:

Discussion Assignments	10%
Written Assignments	10%
Learning Journals	10%
Two Graded Quizzes	40% (20% each)
Final Exam	30%
TOTAL	**100%**

Grading Scale

This course will follow the standard 100-point grading scale defined by the University of the People, as indicated here:

	Grade Scale	Grade Points
A+	98-100	4.00
A	93-97	4.00
A-	90-92	3.67
B+	88-89	3.33
B	83-87	3.0
B-	80-82	2.67
C+	78-79	2.33
C	73-77	2.00
C-	70-72	1.67
D+	68-69	1.33
D	63-67	1.00
D-	60-62	0.67
F	Under 60	0.00

Grade Appeal

If you believe that the final grade you received for a course is erroneous, unjust, or unfair, please contact your course instructor. This must be done within seven days of the posted final grade. For more information on this topic, please review the Grade Appeal Procedure in the University Catalog.

Participation

Non-participation is characterized by lack of any assignment submissions, inadequate contributions to the Discussion Forums, and/or lack of peer feedback to Discussion/Written Assignments. Also, please note the following important points about course participation:

- Assignments must be submitted on or before the specified deadline. A course timeline is provided in the course schedule, and the instructor will specify deadlines for each assignment.
- Any student showing non-participation for two weeks (consecutive or non-consecutive) is likely to automatically fail the course.
- Occasionally there may be a legitimate reason for submitting an assignment late. Most of the time, late assignments will not be accepted and there will be no make-up assignments.
- All students are obligated to inform their instructor in advance of any known absences which may result in their non-participation.

Academic Honesty and Integrity

When you submit any work that requires research and writing, it is essential to cite and reference all source material. Failure to properly acknowledge your sources is known as “plagiarism” – which is effectively passing off an individual’s words or ideas as your own. University of the People adheres to a strict policy of academic honesty and integrity. Failure to comply with these guidelines may result in sanctions by the University, including dismissal from the University or course failure. For more information on this topic, please review the Academic Integrity Policy in the University Catalog.

Unless otherwise stated, any materials cited in this course should be referenced using the style guidelines established by the American Psychological Association (APA). The APA format is widely used in colleges and universities across the world and is one of several style and citation formats required for publication in professional and academic journals. Purdue University's Online Writing LAB (OWL) is a free website that provides excellent information and resources for understanding and using the APA format and style. The OWL website can be accessed here:

Purdue Online Writing Lab. (n.d.). *APA style introduction*. Purdue University. https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_style_introduction.html

Code of Conduct

University of the People expects that students conduct themselves in a respectful, collaborative, and honest manner at all times. Harassment, threatening behavior, or deliberate embarrassment of others will not be permitted. Any conduct that interferes with the quality of the educational experience is not allowed and may result in disciplinary action, such as course failure, probation, suspension, or dismissal. For more information on this topic, please review the Code of Conduct Policy in the University Catalog.