

Course Syllabus for Cptr 380 – Computer Architecture

Walla Walla University - Seventh-day Adventist Higher Education

Winter Term 2020

Course Information

- Class: 10am M – Th (KRH324)

Instructor Information

- Instructor: Dr. Curtis Nelson
- Office: 263 Chan Shun Pavilion
- Phone: 509-527-2076
- Email: curt.nelson@wallawalla.edu
The default communication method between the instructor and students is through email via *mywwu* at your *standard WWU email address*. Please monitor this email address daily for any class updates.
- Web page: http://people.wallawalla.edu/~curt.nelson/cptr380/index_2020.html
- Office Hours: 9 – 10am MW, 1 – 2pm MTu, Other times by appointment



Course Description

Study of the organization and architecture of computer systems. Students will understand how to measure computer performance, the basics of instruction set design, computer arithmetic including floating point algorithms, classical and modern data path and control architectures, and basic memory design including cache and virtual memory systems. Students will complete their choice of a research project, a VHDL implementation of a custom instruction set, or a software project involving an assembler or compiler for a custom instruction set. Prerequisites: [CPTR 280](#), [ENGR 354](#).

Learning Objectives

- Appreciate the role of computer architecture from both a hardware and a software perspective;
- Understand basic processor architecture and the need for parallelism;
- Understand the interplay between the data-path and control units;
- Understand the role of memory in a computer system;
- Understand the basics of computer input/output systems.

Course Materials

- Textbook: *Computer Organization and Design: The Hardware/Software Interface*, David A Patterson and John L. Hennessy, 5th Edition, Morgan Kaufman, 2014
- Textbook companion web site: <http://booksite.elsevier.com/9780124077263/>
- Because of the cutting-edge nature of this course, materials will likely be presented or referenced that are not in the text book. This material is fair game for tests and quizzes.

Course Evaluation

Your instructor would appreciate constructive feedback regarding this course. Near the end of the quarter, you will be emailed a notice reminding you to submit a course evaluation for this class by going to your *mywwu* account and clicking on the *Campus Labs – Course Evaluation* option. This course evaluation should take no longer than 5 minutes to complete. Your responses are confidential, and will be collected by the university via a third-party provider, Campus Labs. All student responses will be summarized and reported to instructor of record, their chair/dean, and academic vice president, after the term is over and the grades posted. Thank you in advance for your participation.

Course Schedule

A daily schedule of course topics is presented in a separate document that can be found on the course web page. The schedule may change based on the professional judgment of the instructor, with appropriate

notice to the students. http://people.wallawalla.edu/~curt.nelson/cptr380/common/outline_2020.pdf

Homework Format Standards

The school of engineering seeks to help you to develop the habit of neat, accurate work through its Homework Format Standard. Please review the document carefully and remember to follow it. Homework that does not meet this standard may receive a reduced grade or be returned ungraded.

http://people.wallawalla.edu/~curt.nelson/hw/hwk_standards_2011.pdf

Course Requirements

Homework

The value of a solution to any problem is directly related to how well the solution is documented. To promote good problem-solving technique and assist those grading the assignments, I require that the guidelines presented by the Walla Walla University School of Engineering be followed. These guidelines are posted on the course web page as mentioned above. Additional requirements are:

- Always staple the assignment sheet to the top of your solutions prior to submission;
- Homework is due at the **beginning** of the class period (plus five minutes);
- Late homework will not be accepted unless prior arrangements have been made with the instructor;
- Points will likely be deducted if your homework does not adhere to these guidelines.

Tests

There will be 2 mid-term tests. There will be no final test, although the final exam time may be used for project presentations. The mid-terms will likely be closed book, with the exception of your calculator and minimal private reference.

Project

Each student (or team of students) will choose a project whose purpose is to apply what you have been studying this quarter to an in-depth topic in an area of computer architecture. More particulars will be provided mid-way through the quarter as the instructor interacts with the class to find appropriate areas of interest.

Course Grade

- Your final grade will be composed of the following three parts:

Homework, attendance, in-class presentations:	30%
Project:	40%
Mid-term exams (2):	30%
- It is safe for you to assume that your minimum final grade, based on raw scores, will be computed as:
 - $\geq 90\%$ A of some sort (A, A-)
 - $\geq 80\%$ B of some sort (B+, B, B-)
 - $\geq 70\%$ C of some sort (C+, C, C-)
 - $\geq 60\%$ D of some sort (D+, D, D-)
 - $< 60\%$ F
- Your current grade in the class can be found anytime in D2L.

Class Attendance

- Class attendance is a good indication of your commitment to learning the material and provides the instructor with visual feedback as to your learning and comprehension;
- Attendance may be used to form a part of your grade as indicated above;
- Students are responsible for any material presented in class **regardless if you are present or not.**

Returned Materials

All materials submitted by a student will be evaluated in a timely manner. In this class, materials are typically returned within one week or less. Students are guaranteed access to all work submitted prior to an exam, graded or ungraded, in order to review for that exam. All graded exams will be returned within one

week barring exceptional circumstances. The scores for graded course work may be accessed in D2L.

Progress Reports

Progress reports will be submitted for students identified “at risk” by the university. As stated before, your current status in the class can be found at any time by consulting the grade book in D2L.

Academic Integrity

- See the Walla Walla University Academic Integrity Policy here: [Academic Integrity Policy](#)
- You are encouraged to consult with classmates while completing your homework. However, the work that you submit must reflect your own independent thought and effort. The guiding principle when determining whether a specific action is appropriate is: Does your approach maximize your learning? For example, a verbal discussion of the general solution approach can improve learning and efficiency. In addition, comparing answers *after* individually completing a homework problem can improve learning, because it enables you to catch and correct mistakes and misconceptions. However, copying the methods, solutions and/or answers of your classmates does not provide you with the practice necessary to learn the material. Similarly, using the solutions manual is not an effective way to learn. If you submit an assignment or exam on which you copied from a classmate or referenced the solutions manual, you have cheated. *Cheating may be rewarded.* With an ‘F’, for the course.
- Remember – you are not just taking a class and earning a grade. You are training for a profession which holds the highest regard for the ethics of its members.

Accommodations for a Disability

- [Disability Support Services](#)
- If you have a physical or learning disability and need accommodations please contact Sue Huett in the Teaching Learning Center, Village Hall, or call 2366. Accommodations for documented disabilities are arranged through the Disability Support Services (DSS) office. This syllabus and course materials are available in alternate format as appropriate to the disability. Accommodations are not retroactive. If you do not declare the disability to the DSS office, you may not receive appropriate accommodations.

Emergency Procedures

An emergency procedures flip chart and evacuation routes are posted in classrooms near the door. Additionally, emergency procedures can be found at: <http://www.wallawalla.edu/security>

Other Accommodations

WWU reasonably accommodates a student for an absence of up to two days per academic year for reasons of faith or conscience, observance of religious holidays, or participation in an organized activity conducted by a religious denomination, church, or organization. The full [policy](#) and [request form](#) can be found on the WWU website.

University Core Themes/Values

University Core Theme	Summary of How the Core Theme is Actualized in this Course
Excellence in Thought	Students learn basic principles of computer systems through thoughtful homework and project work.
Generosity in Service	This course has no service learning component or course requirements for service other than passion about such topics expressed by the instructor.
Beauty in Expression	Students document their learning through homework and project exercises.
Faith in God	This course has no faith component other than passion about such topics expressed by the instructor.