



CMPT 580: Machine Organization and Architecture

General information

Meeting Times and places: Mondays 5:30 – 8:00 pm RI 376

Instructor: Dr. Stefan A. Robila

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Office Hours: Monday 2:15-3:15pm, 4:15-5:15pm Wednesday 10:30-11:30pm or by appointment
Every effort is made during the office hours to have skype connection available.

Purpose of the course

This course is a survey of topics related to computing organization and architecture. Students learn basic computer organization and design, digital functions, data representation, microprogramming, CPU organization, the assembler language, and addressing techniques, stack computers, parallel computers, overlap and pipeline processing, and performance evaluation.

Instructional Objectives

At the end of the course, the students should be able to:

- Apply knowledge of computing, statistics and mathematics to solve problems of design and performance analysis
- Prepare selected reports and presentations detailing some advanced novel topics related to computer architecture and organization
- Become acquainted with recent computer architectures and I/O devices, as well as the low-level language required to drive/manage these types of advanced hardware
- Demonstrate an understanding of the concepts and techniques of constructing machines as a hierarchy of levels

Prerequisites

Knowledge of a high level language is a must. Some of the examples and assignments will require programming implementations (preferably in Java). Basic understanding of computer organization is also assumed.

Class Materials

Textbook (required):

Computer Organization and Architecture: Designing for Performance,
9/E William Stallings, Prentice Hall, 2012, ISBN-10: 013293633X,
ISBN-13: 978-0132936330



The textbook is available through the MSU bookstore although it is possible that better pricing may be obtained through third party vendors..

There is also plenty of other information sources that will help you understand better the course. A list of them is provided by the author (including a list to simulation tools) at:

<http://williamstallings.com/ComputerOrganization/COA9e-student/>

Additional links will be provided and maintained on **Blackboard**. Feel free to email me additions to it.

Class Structure

The class meets once every week for 2h30 minutes each time. Note that the class time does not include any breaks. The class format will be a sequence of lectures, presentations and discussions. The class includes examinations, and homework assignments. All materials will be made available online on **Blackboard**.

Evaluation

Homework (35%): Several homework assignments will be provided. They will cover the topics presented during the lectures and will include practical problems (requiring implementation). The assignments are to be solved individually by each student. The due date and time will be indicated each time the homework is assigned and will be strictly enforced (late submission means no submission). I do not intend to provide any individual extensions of the deadlines. All submitted homework must be provided in printed format (unless allowed by the instructor). Handwritten assignments will not be accepted. It is possible that parts of the homework to take the shape of a project.

Written Examination (50%): There will be one in class midterm examination and one in class final examination (25%). The midterm examination date is tentatively set (see schedule). Any change will be announced at least two full weeks ahead. The final examination is already scheduled by the university on December 17 at class time.

Project Presentation (15%) See schedule for topics. See separate document for general project description

Grading

No curve will be used in assigning the grades. Instead, here is how the grades will be determined:

Total	850-1000	700-849	550-699	500-549	499<
Grade	A	B	C	D	F

The splits between plus and minus grades varies depending on the actual distribution of the final averages. However, if your average is 925 or more, you are assured of A.

Important notes

Accomodations

Students with disabilities are protected by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. According to these laws, “no otherwise qualified person with a disability shall, solely by reason of disability, be excluded from participation in, be denied the

benefits of, or be subjected to discrimination under any program or activity of any public entity.” Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Disability Resource Center (DRC). All accommodations must be approved through the DRC (Webster Hall, Room 100, ext. 5431).

Academic Honesty

“Academic dishonesty is any attempt by a student to submit 1) work completed by another person without proper citation or 2) to give improper aid to another student in the completion of an assignment, such as plagiarism. No student may intentionally or knowingly give or receive aid on any test or examination, or on any academic exercise, that requires independent work. This includes, but is not limited to using technology (i.e., instant messaging, text messaging, or using a camera phone) or any other unauthorized materials of any sort, or giving or receiving aid on a test or examination without the express permission of the instructor.” (Montclair State University Student Code of Conduct II.A. – as revised in August 2012).

Cheating and plagiarism will not be tolerated. Copying work from other students, presenting work not done by you as your own, or otherwise misrepresenting your work will result in penalties including a failing grade for the respective task. University regulations related to this topic will be strictly enforced. For full regulations on this, please consult the MSU Code of Conduct.

Homework assignments and examinations are intended to be solved individually. It should be pointed out that in case of duplicate submissions, all the students involved would be penalized in equal measure. Allowing other people to copy your solutions is considered academic dishonesty. Group work for the term paper/project is allowed only through agreement with the instructor.

Attendance

Attendance is mandatory. Only one unexcused absence is allowed, and in this case it is your responsibility to obtain information on any classroom activity that you may have missed. A second absence will result in the lowering of your grade (for example from an A- to a B+). If you have more than four unexcused absences you will fail the course. Excused absences include illness (a doctor's note is needed) or a serious personal crisis (a letter from the Dean of students is required). Travel time is not an excused absence. Sporting events are not excused absences.

You are expected to take the examinations at the times that will be indicated. Missing an exam or test creates a very difficult situation for all parties involved. As such make-up for missed tests will be administered under extreme circumstances. The attendance policy applies to a missed test. A missed test will be considered an unexcused absence.

The Computer Science departmental policy for incomplete grades goes as follows:

"A grade of incomplete may be assigned only under the following circumstances:

1. The student has completed at least 12 weeks of the course
2. The student has a passing grade in the course
3. The student has a serious reason (e.g., a medical condition) to miss the rest of the work.

Incomplete contracts should call for the student to complete the work as soon as reasonably possible".

SOME IMPORTANT THOUGHTS

Please note that this class requires a constant amount of work. Each week a new book chapter will be considered. You are required to read this chapter in advance and to solve as many problems as possible from the end of the chapter.

The class requires certain programming knowledge. If you have not programmed for some time, you must use the first week to catch up with it. Note that a CS lab is available in RI 105 for your use. If you have some free time while at school, plan to spend it there.

Periodic check of the class website is a must since news and class materials will be continuously posted on it.

Please read carefully any instructions and make sure you understand what you have to do before working on a task and submitting it for grading.

Etiquette: Come to class *on time*—lectures will start at 5:30 pm sharp, even with a single student in the room. Please, plan your commute accordingly.

If you do come late, quietly find a seat and take it with as little disturbance as possible. If you must leave the room—do so quietly.

As you walk into class, kindly *silence all* noise-producing equipment.

How to succeed in this class:

- Take advantage of the posted slides to save effort in taking notes.
- *Pay attention and participate in the class discussions*. If you plan on snoozing in class you should consider taking rest in bed instead.
- If you don't understand something get help *early*.
- Start work on assignments/homeworks *early*.
- Come to office hours prepared with *specific* questions.
- Be honest with yourself and study at home
- Start work on assignments/homeworks *early*.

How to communicate with the instructor outside the class time:

- Stop in at during the posted office hours.
- Email with the subject line starting with **CMPT 580**.
 - *Messages with subjects different than this may take longer to answer. Messages sent during the weekdays will most probably be replied to in the same day. Messages sent on Friday afternoon until Monday morning will be answered on Monday morning.*
- Call the office phone number.
 - *Leaving a message may not result in a quick answer as I am not checking the voicemail too often.*