**CSC 3100 – Computer Architecture and Organization Section: 001**  
**Winter 2016**

**Instructor**
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**Official Course Description**

Pre req: CSC 2200 and 2201, both with grade of C or better; co req: CSC 3101. Organization and architecture of computer systems. Topics include: digital logic and digital systems; machine-level representation of data and programs; assembly level machine organization and programming; register-level description of computer execution and the functional organization of a computer; role and function of programming languages, libraries and operating systems; performance evaluation; systems programming.

**Course Overview**

CSC 3100 is an introduction to computer architecture and organization. Computer architecture is the science and art of selecting and interconnecting hardware components to create a computer that meets functional, performance, and cost goals. Computer organization defines the constituent parts of the system, how they are interconnected, and how they interoperate in order to implement the architectural specification. In this course, you will learn the basics of hardware components from basic gates to memory and I/O devices, instruction set architectures and assembly language, and designs to improve performance.

**Learning Objectives/Outcomes**

- Knowledge of fundamental circuit components and techniques for optimizing circuits.
- Write simple programming constructs and programs using assembly language.
- Understand the translation of assembly instructions into their binary representation.
- Describe and understand the processor memory hierarchy.
- Basic understanding of interrupts, I/O devices, and I/O protocols.
- General knowledge of advances in microelectronics and their implication on computer design.
- Experience the design process in the context of a reasonable size hardware system.

**Requirements**
As the name implies, this is a study of Computer Architecture and Organization, which deals with hardware, not software. However, the lab will include some programming assignments using the cross-assembler that comes with the textbook. There will also be about 6 homework assignments. We will have some quizzes, one midterm exam, and a final exam.

Office Hours
6:00 p.m. – 7:00 p.m. (Monday, Wednesday)
other times by appointment

Classroom
0131 State Hall  MW 5:30 p.m. – 6:45p.m.

Midterm Exam (tentative date)
0131 State Hall  Wednesday, TBD, 5:30 p.m. – 6:45p.m.

Final Exam
0131 State Hall  Wednesday, April 26, 2017, 5:30 p.m. – 6:45p.m. Required

Textbook

*Principles of Computer Hardware (4th Edition)* by Alan Clements

Grading Allocation for the Course

Homeworks (about 6): 25%
Quizzes: 20%
Midterm Exam: 25%
Final Exam: 30%

Grading Scale

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Tentative Course Syllabus

- **Course Introduction and Preliminaries:** 1 lecture
- **Gates, Circuits, and Combinational Logic:** 3 lectures
- **Sequential Logic:** 3 lectures
- **Computer Arithmetic:** 3 lectures
- **Instruction Set Architecture:** 3 lectures
- **Assembly Language Programming:** 4 lectures
- **Structure of the CPU:** 1 lecture
- **Accelerating Performance:** 2 lectures
- **Buses and I/O Mechanisms:** 2 lectures
- **Computer Memory:** 2 lectures
- **CPU, Memory, and the Operating System:** time permitting
Homework Policy
The homework assignments are fundamental to learning the material in this course. Working through the homework problems carefully and thoroughly will improve your understanding of the material significantly. Late homework will receive a reduction of 10% per calendar day.

Exam Policy
All exams in this class will be closed-book and closed notes. Exams can be made up only with a valid excuse as recognized by the University. The exams are typically short answer or multiple choice questions where students need to demonstrate knowledge of specific course content. Attendance is required.

Religious Holidays:
Because of the extraordinary variety of religious affiliations of the University student body and staff, the Academic Calendar makes no provisions for religious holidays. However, it is University policy to respect the faith and religious obligations of the individual. Students with classes or examinations that conflict with their religious observances are expected to notify their instructors well in advance so that mutually agreeable alternatives may be worked out.

Student Disabilities Services:

- If you have a documented disability that requires accommodations, you will need to register with Student Disability Services for coordination of your academic accommodations. The Student Disability Services (SDS) office is located in the Adamany Undergraduate Library. The SDS telephone number is 313-577-1851 or 313-202-4216 (Videophone use only). Once your accommodation is in place, someone can meet with you privately to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.
- Students who are registered with Student Disability Services and who are eligible for alternate testing accommodations such as extended test time and/or a distraction-reduced environment should present the required test permit to the professor at least one week in advance of the exam. Federal law requires that a student registered with SDS is entitled to the reasonable accommodations specified in the student’s accommodation letter, which might include allowing the student to take the final exam on a day different than the rest of the class.

Academic Dishonesty - Plagiarism and Cheating:
Academic misbehavior means any activity that tends to compromise the academic integrity of the institution or subvert the education process. All forms of academic misbehavior are prohibited at Wayne State University, as outlined in the Student Code of Conduct (http://www.doso.wayne.edu/student-conduct-services.html). Students who commit or assist in committing dishonest acts are subject to downgrading (to a failing grade for the test, paper, or other course-related activity in question, or for the entire course) and/or additional sanctions as described in the Student Code of Conduct.

- Cheating: Intentionally using or attempting to use, or intentionally providing or attempting to provide, unauthorized materials, information or assistance in any academic exercise. Examples include: (a) copying from another student’s test paper; (b) allowing another
student to copy from a test paper; (c) using unauthorized material such as a "cheat sheet" during an exam.

- **Fabrication:** Intentional and unauthorized falsification of any information or citation. Examples include: (a) citation of information not taken from the source indicated; (b) listing sources in a bibliography not used in a research paper.

- **Plagiarism:** To take and use another’s words or ideas as one’s own. Examples include: (a) failure to use appropriate referencing when using the words or ideas of other persons; (b) altering the language, paraphrasing, omitting, rearranging, or forming new combinations of words in an attempt to make the thoughts of another appear as your own.

- **Other** forms of academic misbehavior include, but are not limited to: (a) unauthorized use of resources, or any attempt to limit another student’s access to educational resources, or any attempt to alter equipment so as to lead to an incorrect answer for subsequent users; (b) enlisting the assistance of a substitute in the taking of examinations; (c) violating course rules as defined in the course syllabus or other written information provided to the student; (d) selling, buying or stealing all or part of an un-administered test or answers to the test; (e) changing or altering a grade on a test or other academic grade records.

**Course Drops and Withdrawals:** In the first two weeks of the (full) term, students can drop this class and receive 100% tuition and course fee cancellation. After the end of the second week there is no tuition or fee cancellation. Students who wish to withdraw from the class can initiate a withdrawal request on Pipeline. You will receive a transcript notation of WP (passing), WF (failing), or WN (no graded work) at the time of withdrawal. No withdrawals can be initiated after the end of the tenth week. Students enrolled in the 10th week and beyond will receive a grade. Because withdrawing from courses may have negative academic and financial consequences, students considering course withdrawal should make sure they fully understand all the consequences before taking this step. More information on this can be found at: [http://reg.wayne.edu/pdf-policies/students.pdf](http://reg.wayne.edu/pdf-policies/students.pdf)

**Student services:**
- The Academic Success Center (1600 Undergraduate Library) assists students with content in select courses and in strengthening study skills. Visit [www.success.wayne.edu](http://www.success.wayne.edu) for schedules and information on study skills workshops, tutoring and supplemental instruction (primarily in 1000 and 2000 level courses).
- The Writing Center is located on the 2nd floor of the Undergraduate Library and provides individual tutoring consultations free of charge. Visit [http://clasweb.clas.wayne.edu/](http://clasweb.clas.wayne.edu/) writing to obtain information on tutors, appointments, and the type of help they can provide.

**Class recordings:**
Students need prior written permission from the instructor before recording any portion of this class. If permission is granted, the audio and/or video recording is to be used only for the student’s personal instructional use. Such recordings are not intended for a wider public audience, such as postings to the internet or sharing with others. Students registered with Student Disabilities Services (SDS) who wish to record class materials must present their specific accommodation to the instructor, who will subsequently comply with the request unless there is some specific reason why s/he cannot, such as discussion of confidential or protected information.