

Term: Fall 2017  
Class CRN: 15397: Monday & Wednesday 11:30 AM – 12:45 PM in 146 ATEC  
Course Website: Blackboard (<http://blackboard.wayne.edu>)

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Instructor: Samsur Rahman  
E-mail Address: [samsur@wayne.edu](mailto:samsur@wayne.edu)  
Office Hours: Before or after the class or by appointment

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**(Pre/Co)-requisites:**

**Prereq:** CSC 2200 and 2201, both with grade of C or better; MAT 2010 with grade of C-minus or better; **coreq:** CSC 3101

**Official Course Description:**

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.

**Required Textbook:**

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

**Required Software:**

Logically/DigitalWork and EASy68K

**Your final grade will be based on the following weighted average:**

Evaluation will be based on term work alone, which will consist of the class discussions, quizzes, assignments, mid-term exam, and final exam. To summarize, students will be evaluated based on the following criteria:

1. Quizzes – 20% *(In the end of almost every class)*
2. Assignments (about 6) – 25%
3. Mid-term exam – 25%
4. Final exam – 30%

**Grading Scale:**

| Percentage | Grade | Percentage | Grade | Percentage | Grade |
|------------|-------|------------|-------|------------|-------|
| 92% - 100% | A     | 76% - 80%  | B-    | 60% - 64%  | D+    |
| 88% - 92%  | A-    | 72% - 76%  | C+    | 55% - 60%  | D     |
| 84% - 88%  | B+    | 68% - 72%  | C     | 0% - 55%   | F     |
| 80% - 84%  | B     | 64% - 68%  | C-    |            |       |

**Midterm Exam (tentative date):**

Monday, Oct 16th, 2017

**Final Exam:**

Location: ATEC 146

Time: 10:15 AM to 12:15 PM

Date: Monday, Dec 18th, 2017

**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.

**Homework submitted more than three days late will not be accepted.**

Copying of assignments is strictly prohibited and violation will result in a **course grade F** (failing grade). However, discussion of lecture materials and assignments is encouraged. Students are encouraged to visit the Instructor during the assigned office hours. Cheating will result in a **course grade F**.

**Policy on Examination:**

All exams and quizzes in this class will be closed-book and closed notes. Exams/Quizzes can be made up only with a valid excuse as recognized by the University. The exams/quizzes are typically short answer and/or multiple choice questions where students need to demonstrate knowledge of specific course content. The midterms are non-cumulative whereas the final is cumulative.

The examination schedule is published in the syllabus. If you have any conflicts with any of the examination dates, please notify the instructor as soon as possible. The following documentation is required for exam rescheduling.

- Medical Excuse: A signed letter from a physician from the day of the examination indicating that the student had a valid medical reason for missing school. This letter must be on the physician's letterhead and the name and phone number of the physician must be legible.
- Employment Conflict: A signed letter from the student's direct supervisor indicating that an absence from the Detroit-area is required for the student's employment for the dates surrounding the examination.
- Death in the Family or Family Illness: A copy of the death certificate or obituary for the family member who has died. For illness of a family member for whom a student is the primary care-giver, a signed letter from the family member's physician for the day of the examination.
- Transportation Problem: In the event that a student is prevented from arriving on campus due to a transportation delay, the following should be provided:
  - A copy of the police report concerning a traffic accident
  - A copy of the receipt for towing from a towing service

The final determination of the validity of an excuse is the jurisdiction of the faculty member. In all of the above instances, all reasonable attempts must be made to contact the faculty member to notify them of the problem BEFORE the examination. This can be done via email or via phone. If notice is not provided before the examination, no documentation will be accepted.

**Policy on Classroom Attendance:**

Lecture attendance is mandatory. All students are expected to attend all lectures. Active class participation is expected of all students and will help to boost up the course grade in those "borderline" cases between failing and passing. It is recognized that students may be required to miss classes on occasions because of their participation in approved University activities. Examples of such activities include formal participation on University sports teams, debate teams, and performing arts groups. These activities are generally directed by a University official, such as a coach, and usually have a set schedule of events. Students participating in approved University activities should consult Instructors prior to registration, but no later than the end of the second week after the start of classes, to determine the class attendance policy. At this time, the student should provide the instructor with a schedule of planned absences, preferably signed by the University official directing the activity (e.g., Athletic or Program Director or his/her designee), in order to allow the instructor to evaluate and advise the student on the possible impact of the planned absences. In this case, the instructor will consider absences due to participation in approved University activities, as outlined above, to be excused absences, on par with those due to other unavoidable circumstances such as illness and work-related travel. It is the student's responsibility to learn the course material. When classes are missed, for whatever reason, it is the obligation of the students to obtain copies of the class materials and students are responsible for all materials covered in the lectures. An excused absence does not excuse the student from completing work and exams.

### **Policy for Classroom Attendance and Religious Observation:**

Religious holidays (from the online Academic Calendar): 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.

### **University and College Policy on Withdrawal:**

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>. For current policies <http://reg.wayne.edu/students/calendar13-14.php>.

### **Policy on Incomplete Grade:**

A grade of “I” (incomplete) can only be assigned if all of the following criteria are met:

1. the student is not currently failing the class and,
2. there is not a substantial quantity of work yet to be completed,
3. no extra work is required of the instructor beyond the normal duties of grading the paper/exam,
4. there is no need for the student to attend the class in subsequent terms.

The final decision to assign an incomplete grade rests with the instructor. An incomplete grade MUST be made up within one year of assignment of the grade. Incompletes will revert to a failing grade after one calendar year.

### **General Policies**

1. No make-up test will be allowed. Very special circumstances will be considered for make-up examination but the Instructor must be notified as early as possible.
2. University Policy: Students should activate their Access ID and either use their Wayne State email or forward it to their regular email account. The WSU account will be the email address used by the University and faculty to communicate with them.
3. Deferred and incomplete grades will only be granted to students with legitimate reasons.
4. Photocopies of the textbooks are illegal and are violation of the U.S. copyright laws.

### **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.

### **Academic Dishonesty:**

-- *Plagiarism and Cheating* (edited statement from the DOSO’s web site): 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://doso.wayne.edu/codeofconduct.pdf>). 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.

#### **Educational Accessibility 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 for deaf/hearing impaired students). 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. Once you have your accommodations in place, I will be glad to meet with you privately during my office hours or at another agreed upon time to discuss your needs.

#### **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://www.clas.wayne.edu/writing/> to obtain information on tutors, appointments, and the help they can provide.

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***Note:*** *I reserve the right to change any of the above information at any time. It is not an all-inclusive list. For example, you may lose points for whatever I deem inappropriate, or even get bonus points for exceptional work.*

## **TENTATIVE SCHEDULE & COURSE TOPICS\***

*(\*Subject to change at Instructor's Discretion.)*

|   |                 |
|---|-----------------|
| Course Introduction and Preliminaries:    | 1 lecture       |
| Introduction to Computer Hardware:        | 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 |