COSC 290 Section 003

# Spring Semester 2024

**Principles of Computer Organization**

Monday (Lecture) 2:00 pm -- 4:40 pm. YR 203(7800 YR Rd)

Wednesday (Lab) 2:00 pm -- 4:40 pm. YR 203(7800 YR Rd)

**Instructor**: Dr. Yanggon Kim

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## E-mail: [ykim@towson.edu](mailto:ykim@towson.edu),

**Office hours**: Monday 1:00 pm -- 2:00 pm

Wednesday 6:00 pm -- 7:00 pm

**& other hours scheduled by appointment.**

**Office hours can also be online: (Virtual Office hours will use Zoom(Click this link below)**

[**https://towson-edu.zoom.us/my/tu.ykim**](https://towson-edu.zoom.us/my/tu.ykim)

**TA: TBA**

**Prerequisite:**

**COSC 236 and MATH 263 :** Each course completed with a C or higher grade.

**Course Description:**

Computer organization and architecture including computer arithmetic, digital logic, principles of assembly language, memory system organization, computer interfacing, CISC and RISC architecture, and parallel/distributed computing.

**Course Objectives:**

The objective of the course is to provide an introduction to the hardware and software architecture of computer systems.

**Class Organization:**

This class is crucial for almost any other computer class that you will take in the future so it is important that you do well. It is important that you attend all the classes and labs. It is the student’s responsibility to make up missed work.

**Textbooks:**

Computer Organization and Architecture(required)L. Null & J. Lobur, Jones and Bartlett, 2019, 4th/5th, ISBN 978-1-284-04561-1.

*We are participating in the Towson UStore Direct Access Program for COSC 290 002 PRINCIPLES OF COMPUTER ORGANIZATION. This program provides you access to online course materials-like textbooks and publisher courseware- at lower prices than you would otherwise purchase in the bookstore or on the publisher's website. You will be able to access your Direct Access course materials.*

**Grading**: The course grade will use +/- grading scheme and be determined by assignments(Class assignment and Lab. Assignments), attendance, participation, quizzes, and two exams(One midterm Exam and one final exam.).

Class Exercise (11 to 12 assignments) 200

Lab. Assignments(10 – 12 assignments) 200

Quizzes and Attendance: 100

Midterm Exam : 250

Final Exam: 250

## Total 1000

**Attendance**

* Attendance policy in this course adheres to Towson University’s attendance policy <https://catalog.towson.edu/undergraduate/academic-policies/class-attendance-absence-policy/>.
* Students who are absent from class are responsible for any missed work, assignments or assessments (e.g., quizzes and tests etc.).
* For all class meetings, daily attendance will be taken at the beginning of each meeting. **You are permitted one absence without penalty. Use this one absence wisely for any doctor’s appointments or cold symptoms.**
* Tardiness: Being late at least 5 minutes for class, or leaving it 10 minutes early will affect your attendance record. These are disrespectful to the class as well as to the instructor. Two times of tardiness will be counted as one absence.

**Exams:**

Midterm examinations will be given:

**Midterm : March 13 (Wednesday) in class.**

Final exam will be during the final exam period.

**Final Exam. : TBA (March 15 and 21)**

**Note: No makeup exams will be offered for any reason unless student provides an acceptable written document for being absent from an exam in advance.**

**Assignments(Class Exercises):** You will be expected to complete 11 or more class exercises and 10 or more lab. assignments of possibly varying weights.

1. Start each assignment as soon as it is handed out, so that you have time to ask questions.
2. The homework and lab assignments will receive a grade of 0 if not received, or received after the cutoff date and time.
3. The due date for a lab is not the same as the lab cutoff date/time. The due date of each lab assignment will be specified.
4. **Class Exercises should be turned in on the date specified the instructor**. Assignments will **NOT** be accepted after this point. You should always plan to turn in *something* on time for partial credit.
5. All assignments should be submitted through a Blackboard “submission” folder by due dates. I will NOT accept them after a due date. Absence is not an acceptable excuse for failing to turn in assignments. Anticipate any technical complications (e.g., computer crash, Internet connection problems and damaged files) and allocate extra time to finish your assignment for a specified deadline.

* All assignments are expected to be **INDIVIDUAL** work. All work handed in must be original. Duplicate or very similar programs receive a negative grade.

**Repeating A Course:** A student may not repeat a course more than once without prior permission of the Academic Standards Committee.

**Academic Integrity Policy:**

All student work including assignments, presentations, and tests must adhere to the university’s Student Academic Integrity Policy <https://www.towson.edu/about/administration/policies/documents/polices/03-01-00-student-academic-integrity-policy.pdf>. The policy addresses such academic integrity issues as plagiarism, fabrication, falsification, cheating, complicity in dishonesty, abuse of academic materials, and multiple submissions. See the last page of this syllabus for the department’s policy concerning plagiarism and cheating. Penalties to violation of academic integrity ranges from F for the assignment to F for the course, in addition to a report filed in the Office of Student Conduct and Civility Education.

Students are responsible members of the academic community. You are therefore obligated not to violate the basic standards of integrity. You are also expected to take an active role in encouraging other members of the community to respect those standards. Should you have reason to believe that a violation of academic integrity has occurred, you are encouraged to make the suspicion known to a member of the faculty or University administration.

Cheating means using, attempting to use, and/or disseminating unauthorized materials, information, notes, study aids, videos or other devices in any academic exercise. This includes unauthorized communication of information during an exercise or exam.  Some examples include but are not limited to:  Copying from another student’s paper or receiving unauthorized assistance during any graded deliverable; using books, notes or other devices (e.g., calculators, phones, watches, laptops, or other internet enabled devices) when these are not authorized; procuring without authorization tests or examinations before the scheduled exercise (including discussion of the substance of examinations and tests when it is expected these will not be discussed); copying reports, laboratory work, computer programs or files and the like from other students; collaborating on laboratory or computer programs or files and the like with other students; collaborating on laboratory or computer work without authorization and without indication of the nature and extent of the collaboration; sending a substitute to take an examination, using solutions manuals, providing exam and assignment questions to student websites or using such a website to complete an assignment and/or exam (including free or pay websites that maintain textbook and/or instructor solutions).  To clarify, copying or collaborating with other students or using external resources, including other people, on any type of assignments that are expressly designed to be completed individually is cheating.

Complicity in Academic Dishonesty means helping or attempting to help another commit an act of academic dishonesty.  Some examples include but are not limited to: Allowing another to copy from one’s paper during an examination or test; distributing test questions or substantive information about the material to be tested without authorization before the scheduled exercise; collaborating on academic work that is expressly designed to be completed individually; taking an examination or test for another student; signing a false name on an academic exercise; or sharing assignment or exam information before, during, or after the deliverable in written, electronic, video, or verbal form. (Note: Collaboration and sharing information are characteristics of academic communities. These become violations when they involve dishonesty.  Students should seek clarification when in doubt).

Abuse of Academic Materials means destroying, stealing, or making inaccessible library or other resource materials. Some examples include: Stealing or destroying library or reference materials needed for common academic exercises; hiding resource materials so others may not use them; destroying computer programs or files needed in academic work; stealing or intentionally destroying another student’s notes or laboratory experiments; receiving assistance in locating or using sources of information in an assignment where such assistance has been forbidden by the instructor.

**Lecture Schedule (Tentative)**

Week 1: Introduction (Ch. 1)

Week 2 - 3: Data Representation in Computer Systems (Ch. 2)

* + - Positional Numbering System
    - Converting Between Bases
    - Signed Integer Representation

Week 4 - 5: Data Representation in Computer Systems (Ch. 2)

* + - Floating-Point Representation
    - Character Codes
    - Error Detection and Correction

Week 6 – 7: Boolean Algebra and Digital Logic (Ch. 3)

* Boolean Algebra
* Logic Gates
* Digital Components
* Combinational Circuits
  + - Karnaugh Maps
    - Designing Circuits
    - Sequential Circuits
* Midterm Exam (March 13(Wednesday) from 2:00 pm)

Week 8: Spring Break

Week 9 : MARIE: An Introduction to a Simple Computer (CH. 4)

* CPU Basics and Organization
* The Bus
* Clocks
* I/O Subsystem
* Memory Organization

Week 10 - 11: MARIE: An Introduction to a Simple Computer (CH. 4)

* MARIE

Week 12 - 13: Instruction Set Architecture (Ch. 5)

* Instruction Formats
* Instruction Types
* Addressing
* Instruction Pipelining
* Examples of ISAs

Week 14 - 16: Memory (Ch. 6)

* Types of Memory
* Cache Memory

**Final Exam : TBA (during the final exam period between March 15 and 21)**