



This course is an intensive introduction to the fundamentals of computer architecture. We will discuss the basic design, or architecture, of computing hardware. Computer systems involve architecture design at many levels. We will focus on the instruction set architecture (ISA) level (the interface between the software and computing hardware) and the microarchitecture level (the computing hardware itself). We will examine to some extent, the level above the instruction set (the programming language level) and the level below the microarchitecture (the logic gate level) in order to deepen our understanding of computing systems.

**Topics:**

1. Introduction to Computer Abstractions
2. Instructions: Language of the Computer
3. Computer Arithmetic
4. Representation of Floating Point Values and Floating Point Arithmetic
5. Datapath Design
6. Control Path Design
7. Pipelined Datapath and Control
8. Data Hazards and Forwarding
9. Control Hazards and Prediction
10. Instruction-level Parallelism
11. Cache Memories
12. Virtual Memory
13. Exceptions and interrupts
14. Multiprocessor Architectures

**Reasonable Accommodation Policy:** The Accessibility and Disability Resource Center is committed to supporting students with disabilities to ensure that they are able to enjoy equal access to all components of their education. This includes your academics, housing, and community events. If you are experiencing a disability or a mental/medical health condition that has a significant impact on one or more life functions, you can receive accommodations to provide equal access. Possible disabilities include, but are not limited to, learning disabilities, AD(H)D, mental health, and chronic health. Additionally, we support students with temporary medical conditions (broken wrist, shoulder surgery, etc.) and pregnancy. To discuss potential accommodations, please contact the ADRC at 730 College Avenue, (ph.) 405.325.3852, or [adrc@ou.edu](mailto:adrc@ou.edu).

**Academic Integrity:** Cheating is strictly prohibited at the University of Oklahoma, because it devalues the degree you are working hard to get. As a member of the OU community it is your responsibility to protect your educational investment by knowing and following the rules. For specific definitions on what constitutes cheating, review the Student's Guide to Academic Integrity at <https://www.ou.edu/integrity/students>

To be successful in this class, all work on exams and quizzes must be yours and yours alone. You may not receive outside help. On examinations and quizzes you will never be permitted to use your notes, textbooks, calculators, or any other study aids. Should you see someone else engaging in this behavior, I encourage you to report it to myself or directly to the Office of Academic Integrity Programs. That student is devaluing not only their degree, but yours, too. Be aware that it is my professional obligation to report academic misconduct, which I will not hesitate to do. Sanctions for academic misconduct can include expulsion from the University and an F in this course, so don't cheat. It's simply not worth it.

**Integrity Pledge:** The following pledge, along with a student signature line, will be placed on quiz and exam sheets:

*On my honor, I affirm that I have neither given nor received  
inappropriate aid in the completion of this exercise.*

**Land Acknowledgement Statement Provided by OU's Tribal Liaison office:**

Long before the University of Oklahoma was established, the land on which the University now resides was the traditional home of the "Hasinai" Caddo Nation and "Kitikiti'sh" Wichita & Affiliated Tribes.

We acknowledge this territory once also served as a hunting ground, trade exchange point, and migration route for the Apache, Comanche, Kiowa and Osage nations. Today, 39 tribal nations dwell in the state of Oklahoma as a result of settler and colonial policies that were designed to assimilate Native people. The University of Oklahoma recognizes the historical connection our university has with its indigenous community. We acknowledge, honor and respect the diverse Indigenous peoples connected to this land. We fully recognize, support and advocate for the sovereign rights of all of Oklahoma's 39 tribal nations. This acknowledgement is aligned with our university's core value of creating a diverse and inclusive community. It is an institutional responsibility to recognize and acknowledge the people, culture and history that make up our entire OU Community.

**Religious Observance:** It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty. [See Faculty Handbook 3.15.2]

**Adjustments for Pregnancy/Childbirth Related Issues:** Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your professor or the Disability Resource Center at 405/325-3852 as soon as possible. Also, see <http://www.ou.edu/eoo/faqs/pregnancy-faqs.html> for answers to commonly asked questions.

**Title IX Resources and Reporting Requirements:** Anyone who has been impacted by gender-based violence, including dating violence, domestic violence, stalking, harassment, and sexual assault, deserves access to resources so that they are supported personally and academically. The University of Oklahoma is committed to offering resources to those impacted, including: speaking with someone confidentially about your options, medical attention, counseling, reporting, academic support, and safety plans. If you would like to speak with someone confidentially, please contact OU Advocates (available 24/7 at 405-615-0013) or another confidential resource (see “Can I make an anonymous report?”). You may also choose to report gender-based violence and discrimination through other means, including by contacting the Institutional Equity Office (ieo@ou.edu, 405-325-3546) or police (911). Because the University of Oklahoma is committed to the safety of you and other students, I, as well as other faculty, Graduate Assistants, and Teaching Assistants, are mandatory reporters. This means that we are obligated to report gender-based violence that has been disclosed to us to the Institutional Equity Office. This includes disclosures that occur in: class discussion, writing assignments, discussion boards, emails and during Student/Office Hours. For more information, please visit the Institutional Equity Office.

**Final Exam Preparation Period:** Pre-finals week will be defined as the seven calendar days before the first day of finals. Faculty may cover new course material throughout this week. For specific provisions of the policy please refer to OU’s Final Exam Preparation Period policy (<https://apps.hr.ou.edu/FacultyHandbook#4.10>).

**Positive class climate** - It is your instructor’s intention to provide a positive class climate that is supportive and in which students feel accepted and valued. All students have the right to be safe to learn in an environment free from negativity and bias. Student behavior that is contrary to a positive class climate will be corrected and may result in the student being removed from the course. In both classroom and online discussions students are expected to treat each other with respect. I welcome students of all race, gender, religion, sexual orientation, gender identity, age, marital status veteran status or disability.

Because I feel strongly about creating welcoming and inclusive learning environments, I continue to learn by attending inclusive teaching workshops for faculty and also Aspiring Ally workshops for folks who want to create welcoming and inclusive classrooms for their LGBTQ+ students. This also means that I am committed to respecting your name and pronoun. If you choose to do so, you can also add your pronoun to your Canvas profile, which will be visible to others as well as me. You may do this by selecting “account”, “profile”, “edit profile”, and then select your pronouns. If you would, at any point, like to update me of any name or pronoun changes please reach out to me. For additional guidance you may wish to visit with the Gender + Equality Center.

**Late submission policy:** Late homework will be penalized 10% per day and will be accepted up to one week late. Additionally, the lowest **one** homework grade will be dropped in the calculation of your final grade. Late lab submissions will be penalized 10% per day. They will

be accepted no later than **two days** after the due date after which time a reference solution will be provided. Late completion of participations assignments will be penalized 50% after the expected completion date but will be accepted up until the final exam. Exceptions due to illness or other extraordinary circumstances should be requested before the class in which the assignment is due.

**Emergency Protocols:** During an emergency, there are official university procedures that will maximize your safety.

*Severe Weather:* If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather 1. LOOK for severe weather refuge location maps located inside most OU buildings near the entrances 2. SEEK refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building. 3. GO to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows. 4. GET IN, GET DOWN, COVER UP. 5. WAIT for official notice to resume normal activities.

[Link to Severe Weather Refuge Areas](#) , [Severe Weather Preparedness - Video](#)

*Armed Subject/Campus Intruder:* If you receive an OU Alert to shelter-in-place due to an active shooter or armed intruder situation or you hear what you perceive to be gunshots:

1. GET OUT: If you believe you can get out of the area WITHOUT encountering the armed individual, move quickly towards the nearest building exit, move away from the building, and call 911. 2. HIDE OUT: If you cannot flee, move to an area that can be locked or barricaded, turn off lights, silence devices, spread out, and formulate a plan of attack if the shooter enters the room. 3. TAKE OUT: As a last resort fight to defend yourself.

For more information, visit <http://www.ou.edu/emergencypreparedness.html>

[Shots Fired on Campus Procedure - Video](#)

*Fire Alarm/General Emergency:* If you receive an OU Alert that there is danger inside or near the building, or the fire alarm inside the building activates: 1. LEAVE the building. Do not use the elevators. 2. KNOW at least two building exits 3. ASSIST those that may need help 4. PROCEED to the emergency assembly area 5 ONCE safely outside, NOTIFY first responders of anyone that may still be inside building due to mobility issues. 6. .WAIT for official notice before attempting to re-enter the building.

[OU Fire Safety on Campus](#)

**Mental Health Support Services:** If you are experiencing any mental health issues that are impacting your academic performance, counseling is available at the University Counseling Center (UCC). The Center is located on the second floor of the Goddard Health Center, at 620 Elm Rm. 201, Norman, OK 73019. To schedule an appointment call (405) 325-2911. For more information, please visit University Counseling Center.