

# ECE 8405 - Computer Organization & Design

Prof. Xun Jiao  
ECE Department  
Villanova University  
Villanova, PA 19085

Phone: (610) 519-7369  
Email: [xun.jiao@villanova.edu](mailto:xun.jiao@villanova.edu)  
Office: Tolentine 415

## Time and Place

T 6:10 pm-8:50 pm on Zoom  
<https://villanova.zoom.us/j/96056212931>

## Office Hours

T 3 pm-5 pm or by appointment

## Textbook

John Hennessy, David Patterson, "Computer Architecture: A Quantitative Approach (6th Edition)"

## Prerequisites

Fundamentals of digital design and VHDL/Verilog

## Course Description

In this course, we will study modern computer hardware design and the design tradeoffs at the hardware-software intersection. We will study basic concepts and fundamental knowledge of computer architecture, such as instruction set architecture (ISA), computer performance, memory hierarchy, computer architecture considering security, low-power, and fault tolerance. Further, we will study state-of-the-art contents in domain-specific architectures such as artificial intelligence (AI)-hardware accelerator.

## Grading Policy

Assignments - 40%  
Midterm - 30%  
Final - 30%

## Disability Policy

"It is the policy of Villanova to make reasonable academic accommodations for qualified individuals with disabilities. If you are a person with a disability (non-physical) please register with the Learning Support Office by contacting [Learning.support.services@villanova.edu](mailto:Learning.support.services@villanova.edu) or 610-519-5176 as soon as possible. Registration is needed in order to receive accommodations.

The Office of Disability Services collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The ODS provides Villanova University students with physical disabilities the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact Gregory Hannah, advisor to students with disabilities @ 610-519-3209 or visit the office on the second floor of the Connelly Center."

## Academic Integrity

The College of Engineering is committed to creating an environment of academic integrity and ethical decision-making that we hope is reflected in the actions of our students and graduates. As Villanova students, integrity is central to the University mission. As engineers, our code of conduct requires us to place honor and integrity at the forefront of everything we do. As engineering students, it is expected that you will begin to adopt these values and instill them into your work habits. Students violating the academic integrity policy will receive a zero on that assignment or exam and the violation will be reported to the Associate Dean for Academic Affairs. Students are encouraged to read the University's academic integrity policy. The College of Engineering has adopted the following exam guidelines:

Students must arrive before the start of the exam. Under exceptional circumstances a student may need to arrive late, but he/she can enter the exam no later than 5 minutes after the start of the exam.

All cell phones must be turned off and stored away until the student exits the exam room.

The official Villanova class attendance policy must be followed when requesting excuses for absences or lateness to an exam.

Each student must write and sign the following statement, "I have neither given nor received any unauthorized assistance in the completion of this exam."

You are encouraged to consult the Academic Integrity Policy and Code at the beginning of each semester (<https://www1.villanova.edu/villanova/provost/resources/student/policies/integrity.html>).

## Attendance Policy

Where possible, students should inform their instructors if they plan to be late or absent from class. In all cases, students should be prepared to provide documentation to petition for excused absences to the Associate Dean for Student and Strategic Programs, Dr. Stephen Jones. Students should use the form for requesting an excused absence. Excused absences do not count toward a failure in the course for first year students. Absence from class does not release the student from work assigned. Students who miss an in-class obligation (exam, presentation, etc.) due to an excused absence will not be penalized - the instructor may offer a make-up test, arrange an alternative time for a presentation, exempt a student from the assignment, or provide another arrangement.

The University's list of excused absences for all students includes the following:

participation in NCAA athletic competitions

participation in special academic events (e.g., conferences, field trips, project competitions)

participation in official university business (e.g., student representatives attending meetings related to university governance)

attendance at significant events involving the immediate family (e.g., funerals, weddings)

religious holidays - see the University's policy on Religious Holidays

college-approved participation in placement activities (e.g., job interviews, graduate school interviews, attending job fairs)

documented serious illness or disability