

Syllabus: Computer Architecture and Organization

Semester Spring 2026

Note:

- The course description, course objectives, and learning outcomes are under review and may be changed during the semester.

Course Information

- **Course Number and Title:** CDA 3100 Computer Architecture and Organization
- **Section:** 01 & 02
- **Credit Hours:** 3
- **Academic Term:** Spring 2026

Instructor Information

- **Instructor:** Sathish Chandra Akula
- **Office Location:** BARC-2237
- **Office Hours:** TBD
- **Other Ways to Contact You:** Appointment through email sakula@floridapoly.edu

Course Details

- **Official Catalog Course Description:** This course takes a broader and more holistic view of the system as both hardware and systems software, covering such topics as data representation, machine language, processor architecture, memory hierarchy, linking, loading, processes, signals, performance optimization, virtual memory, I/O, and network and concurrent programming.
- **Course Pre-Requisites:** CDA2108
- **Required Texts:** Yes
 1. **Textbook:** Computer Systems: A Programmer's Perspective, 3/E (CS:APP3e) ISBN13: 9780134092669 by Randal E. Bryant and David R. O'Hallaron.
 2. **Equipment and Materials:**
 - **Hardware:** A recent computer with Windows 10/11
 - **Software:** Virtual Box + Ubuntu LTS 22.04 VM
- **Course Objectives:**

After the course, students will be able to

 1. Describe computer architecture and organization from a holistic view
 2. Explain processor architecture, memory hierarchy and virtual memory
 3. Apply data representation and machine language in optimization of high-level programming languages
- **PLOs (Program learning outcomes) of CS:**
 1. **Analyze** a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
 2. **Design, implement, and evaluate** a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
 3. **Communicate** effectively in a variety of professional contexts.
 4. **Recognize** professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
 5. **Function** effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
 6. **Apply** computer science theory and software development fundamentals to produce computing-based solutions
- **Course Learning Outcomes and Alignment with Program Outcomes:**

CLmoz	Maps To PLO
CLO 1	PLO 1, PLO 6
CLO 2	PLO 2, PLO 6
CLO 3	PLO 2, PLO 6

Academic Support Resources

- **Library:** Students can access the Florida Polytechnic University Library through the University website and [Canvas](#), on and off campus. Students may direct questions to Academic Success Center success@floridapoly.edu or by email, library@floridapoly.edu.
- **Peer Learning Strategists:** These are specially trained student leaders who help their peers strategize approaches to course content and work through solution methods. PLS students work in collaboration with the courses they support so the content and methods are aligned with your instructors' expectations. The PLS room is located on the first floor of the IST in the center hallway.
- **Writing Center:** Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit <https://floridapolytechnic.libguides.com/writingservices>.

Course Schedule(Tentative)

Week	Topic	Chapter covered Labs and exams
1	Programs, processors, caches and storage devices	
2	OS manages the hardware, system communication, Amdahl's Law and Concurrency and Parallelism	Ch1: Tour of systems
3	Information storage, integer representation and algorithms	
4	Floating point number representation and algorithms	Ch2: Representing and Manipulating Information
5	Program Encodings, Data Formats, Accessing Information, Arithmetic and Logical Operations	
6	Control, Procedures, Array Allocation and Access	Ch3: Machine-Level Representation of Programs
7	Heterogeneous Data Structures, Combining Control and Data in Machine-Level Programs, Floating-Point Code	
8	Reviews and Midterm exam	Mid 1
9	---- SPRING BREAK ----	
10	The Y86-64 Instruction Set Architecture, Logic Design and the Hardware Control Language HCL	Ch4: Processor Architecture

11	General Principles of Pipelining, Pipelined Y86-64 Implementations	
12	Storage Technologies, Locality, The Memory Hierarchy	Ch6: The Memory Hierarchy Mid 2
13	Cache Memories, Writing Cache-Friendly Code	
14	Physical and Virtual Addressing, Address Spaces, VM as a Tool for Caching, VM as a Tool for Memory Management, VM as a Tool for Memory Protection	Ch9: Virtual Memory
15	Address Translation, Memory Mapping, Dynamic Memory Allocation, Garbage Collection	
16	Final review	
	Final exam	

Course Policies

Attendance

- This class is a Face-to-Face mode. It means students have to attend all class meetings in-person. It means it is a traditional class teaching like. ([Please read Basic rules in following university policies section](#)). Exceptions to any attendance requirements may be made on a case-by-case basis, only on medical ground. (University Policy, FPU-5.0010AP).
- Attendance is expected and may be recorded. Exceptions may be made case-by-case with documentation.

Students Feeling Sick

Students should not come to class if they are feeling ill, particularly if experiencing symptoms of COVID-19, or if you have been directed by a health professional to quarantine. Students who are experiencing an emergency situation that aligns with an academic exercise of consequence (e.g./a Common Exam) should work with CARE Services at care@floridapoly.edu

Late Work/Make-up work

- To make up an exam and project presentation, signed document from authority (such as doctor, clinic, law enforcement officers, etc.) is needed.
- Late work not accepted with exceptions of documented excuses.
- Other makeup work need approval from the instructor and request in advance.

Grading Scale

(See also [University Grading Policy](#)).

A : above 93%

A- : 90% - 92%

B+ : 87% - 89%

B : 83% - 86%

B- : 80% - 82%

C+ : 77% - 79%

C : 73% - 76%

C- : 70% - 72%

D+ : 67% - 69%

D : 63% - 66%

D- : 60% - 62%

F : below 60%

Assignment/Evaluation Methods

Assignment/Evaluation methods	Weight
Labs	12.5
Quizzes	12.5
Homework	15
Project & Presentation	20
Mid exam	20
Final Exam	20
Total	100%

Academic Support Resources

Library: Students can access the Florida Polytechnic University Library through the University website and [Can-vas](#), on and off campus. Students may direct questions to library@floridapoly.edu.

Tutoring and Learning Center (TLC): : The Tutoring and Learning Center (The TLC) provides tutoring to all Florida Poly students who may need additional academic support. The TLC is staffed by students who have excelled in the courses they tutor. They offer support by reviewing concepts and materials from class, clarifying points of confusion and providing assistance with learning strategies. While the focus of TLC is to provide support to students in freshman-level courses, upper-level courses are also tutored at the Center. The TLC is located in the IST Commons (second floor).

Knack Tutoring: Students looking for additional assistance outside of the classroom are advised to consider working with a peer tutor through Knack. Florida Polytechnic University has partnered with Knack to provide students with access to verified peer tutors who have previously aced this course. To view available tutors, visit floridapoly.joinknack.com and sign in with your student account.

Academic Success Coaches: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.

- **Writing Center:** Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit <https://floridapoly.edu/writingcenter>.

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The University, through the Office of Disability Services (ODS), facilitates reasonable accommodation for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodation.

If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the [ODS student portal](#) and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodation must be made in advance. Accommodation is not retroactive.

If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

The Office of Disability Services (ODS):
DisabilityServices@floridapoly.edu
(863) 874-8770
The Access Point

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See [University Policy](#).)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University [Ombuds Office](#), BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at [Peace River Center](#), 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The [Title IX Coordinator](#) is available for any questions to discussion [resources and options](#) available.

Academic Integrity

The faculty and administration take academic integrity very seriously. Violations of [academic integrity regulation](#) include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties.

Any "special" instructions that are appropriate for academic integrity and the course should go here.

(It is essential that a heading and a statement on what constitutes, includes, academic integrity be included in the syllabus, and that the students be made aware of academic integrity at the beginning of a course.)

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidentally, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is prohibited.

Civility and Collegiality (optional statement)

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. Communication, written, oral and behavioral, between faculty and students must remain respectful. Within and outside of the classroom, students must refrain from derogatory comments toward the faculty member and their fellow students, and faculty as well must refrain from derogatory comments toward their students. Faculty and students should address each other with respect, in accordance with the wishes of the faculty and the students: for example, no one should be addressed by their last name alone.

Faculty from the outset of a course can and should specify what constitutes activities and behavior that take away from, that diminish, the educational environment. An individual student's distracting behavior impedes the education of fellow students, which itself is a form of disrespect. Civility and collegiality also include respecting each

other's time: for example, neither students nor faculty should arrive late to class (unless unforeseen, pressing circumstances prevail); faculty should be present at the posted office hours; and students and faculty should be punctual when meeting times are scheduled. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.