Instructor: Dr. Pushkar Ogale  
Email: ogalep@sfasu.edu  
Phone: (936) 468-2508  
Office: 312 D STEM

Office Hours:  
Monday 10:00 AM – 11:00 AM, 2:30 PM – 3:30 PM  
Tuesday 10:00 AM – 11:00 AM, 12:30 – 2:00 PM  
Wednesday 2:30 PM – 3:30 PM  
Thursday 12:30 PM – 2:00 PM  
Friday 10:00 AM – 11:00 AM (Other times by appointment only)

Note: Office hours may be supported Online on Zoom at:  
[https://sfasu.zoom.us/j/99317676538?pwd=R0dJRmVteEU4ZHruVEo1b2E5allyUT09](https://sfasu.zoom.us/j/99317676538?pwd=R0dJRmVteEU4ZHruVEo1b2E5allyUT09)

Class meeting:  
Time: 11:00 AM – 12:15 PM TR  
Place: STEM 314 – Note: Classes may be Live Streamed Online on Zoom at:  

Credit hours: 3  
Pre-requisites: CSCI 2302  
Grade Reminder: Must have a grade of C or better in each prerequisite course.

Catalog Description: Architectural structure and organization of computers. Analysis of the processor components, memory structure, I/O section, and bus. Study of system component interrelationships and interactions with the system kernel and selected programming techniques.

Purpose of Course: To provide the student with a solid foundation in system level organization and architecture concepts using the operating system’s application programmer’s interface, kernel mechanisms, and data structures. To expose the student to system hardware component relationships and interactions with the system kernel via C language programming. Upon completion of this course, students should have a complete understanding of the role played by each major component of a modern computer system.

More: [http://sfasu.edu/docs/computer-science/undergraduate-course-CSCI2314.pdf](http://sfasu.edu/docs/computer-science/undergraduate-course-CSCI2314.pdf)

Program Learning Outcomes:  
Program learning outcomes define the knowledge, skills, and abilities students are expected to demonstrate upon completion of an academic program. These learning outcomes are regularly assessed to determine student learning and to evaluate overall program effectiveness.

- Students majoring in the Department of Computer Science may access program learning outcomes at [http://www.sfasu.edu/academics/colleges/sciences-math/computer-science/about/accreditations](http://www.sfasu.edu/academics/colleges/sciences-math/computer-science/about/accreditations)

Student Learning Outcomes:  
In general, SLOs in a course are specific and include the exact knowledge, skill or behavior taught in the course in support of the more global PLOs. For additional information on meaningful and measurable learning outcomes, see the assessment resource page [http://www.sfasu.edu/assessment/index.asp](http://www.sfasu.edu/assessment/index.asp).

Text and Material:  
Reference Books: Please refer to the syllabus link in the Purpose of Course section above.

Course Requirements: Students are expected to attend classes and ensure they understand the material being taught. Students are encouraged to ask questions and get their difficulties resolved while in class. Regular quizzes, homework assignments, and examinations will test the student understanding of the material. The weightage to these components is specified in the Grading Policy below.
Course Calendar: This course meets for a minimum of 37.5 lecture contact hours during the semester, including the final exam. Students have significant weekly reading assignments. Students are expected to complete homework/programming assignments, quizzes, and 2-3 periodic exams in addition to the final exam. Students are expected to prepare for any class assignments or quizzes over the material covered in class or in the reading material. Successful completion of these activities requires at a minimum 6 additional hours of outside of classroom work each week. In addition the course will require 150 asynchronous minutes to be completed. This component will be addressed through attending a seminar/researching a relevant topic followed by a discussion board summary or a Quiz. Please see the schedule on the last page of the syllabus that details the topics to be covered during the semester. The schedule lists the reading assignments that the students are expected to follow.

Grading Policy: Overall grade will be based on the performance on the following components

1) Attendance 5 % (Bonus for full attendance and completion of course evaluation)
2) Quizzes 10%
3) HW Assignments 30%
4) 2 Midterm Exams 30% (2 x 15% each)
5) Final Examination 30%

Grade bands are usually 90+ A/80+ B/70+ C/60+ D/ 59 and lower F

Exam Note: Examinations are weighted at 60% of the overall course grade. Valid student ID cards must be presented on each examination day. (No ID... No exam...Grade of zero)
There are no exemptions from the final examination and no changes in taking the final examination. Check the final exam time. If the final exam time is a problem, you need to drop this course.

Attendance policy: Attendance and constructive class participation is expected. There is no specific grade for attendance. But students who have full attendance except for one unexcused absence will qualify for 5% bonus grade provided they also complete the end of the semester course evaluation. Students traveling for University business/events and those out sick will be excused after they turn in a medical note of absence or University related activity letter from the appropriate authorities.

Educational Objectives: Upon successful completion of the course, students should be able to:

1. Elaborate the basic principles of computer architecture and organization and to identify the factors that influence the performance of the system.
2. Demonstrate a solid knowledge of and an ability to properly use the following C language features and facilities: indirection (pointers), data storage, selection structures, bit operations, and interrupt facilities.
3. Describe some modern architectures such as RISC, Superscalar, VLIW (very large instruction word).
4. Describe the operation of performance enhancements such as pipelines, dynamic scheduling, branch prediction, and caches.
5. Describe the principles of computer system design.
6. Explore operating system kernel interactions with the memory, I/O, peripherals, and bus system components.
7. Demonstrate an understanding of the standard models of computers including the instruction fetch cycle and the physical components involved in this process; memory, CPU, I/O.
8. Demonstrate skills in problem analysis and program design.
Course Content

Bits, Data Types, and Operations .......................................................... 3
  - Bits and the concept of a data type, type conversions
  - Logical and arithmetic operations
  - Integer and floating-point data types, ASCII codes

Digital Logic Structures ................................................................. 3
  - Boolean algebra and DeMorgan’s Law
  - CPU design: registers, and combinatorial logic structures
  - Memory design; address space and addressability

Computer structures, function, interconnection .................................. 9
  - Processor and register organization, bus, clock
  - Instruction pipelining
  - Memory organization and addressing
  - Bus interconnection structures

Input and Output in Interfacing and Communications ............................ 3
  - I/O architectures, Programmed and Interrupt-driven I/O
  - Direct memory access
  - I/O channels and processes

Machine Issues and Concepts ......................................................... 6
  - Instruction Set Architecture: instruction organizations
  - Memory addressing
  - CPU structures and operations

Memory Systems Organization ......................................................... 3
  - Semiconductor memory design and operation
  - Cache memory
  - Memory hierarchy

RISC and Multiprocessor Architectures ............................................. 6
  - Parallel and multiprocessor architectures
  - RISC, CISC, VLIW, current

High-level Language Utilization of Hardware Components .................... 9
  - C data types and variables, global and local scope
  - Tables and space allocation for resources
  - Control stack organization and allocation
  - Expressions and statements; arithmetic and logical operators
  - Control structures, data structures, and pointers
  - Functions and parameter passing

Exams (excluding the final) ................................................................ 3

TOTAL 45

Academic Integrity (A-9.1)

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the
falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit. Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

Withheld Grades Semester Grades Policy (A-54)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

Students with Disabilities
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

Mental Health
SFASU values students' mental health and the role it plays in academic and overall student success. SFA provides a variety of resources to support student's mental health and wellness. Many of these resources are free, and all of them are confidential.

On-campus Resources:
1) SFASU Counseling Services
   www.sfasu.edu/counselingservices
   3rd Floor Rusk Building
   936-468-2401

2) SFASU Human Services Counseling Clinic
   www.sfasu.edu/humanservices/139.asp
   Human Services Room 202
   936-468-1041

3) Crisis Resources:
   Burke 24-hour crisis line 1(800) 392-8343
   Suicide Prevention Lifeline 1(800) 273-TALK (8255)
   Crisis Text Line: Text HELLO to 741-741

CLASS INFORMATION AND POLICIES
Department of Computer Science, STEM 312, 468-2508

Attendance: Seating assignments will be made, and roll will be taken regularly. Attendance may be taken into consideration for your final grade. If you come to class, you are expected to be present and awake the entire class period unless you have been given permission to leave early. If you are absent from class, please make sure to get notes from a classmate. There will be no smoking, no chewing of tobacco, no eating or drinking, no bare feet, and no cell phone use during class. Cell phones and other electronic communication devices must be turned off during class. Possession of a cell phone or other electronic communication device during an exam will result in an examination grade of zero. No disruptive behavior including offensive language will be tolerated in a computer science facility or related activity. Such behavior may result in administrative removal from class. Only students officially registered for the course and approved assistants may attend class. Please do not walk across the front of the room after the class has started. Students entering the classroom after the lecture has started should take a seat in the back of the room.

Examination Policy: All class examinations are considered to be a major part of the course work upon which a large part of the course grade depends. There are NO make-up exams! Class examinations will be announced at least two classes
prior to the examination. If you have a conflict with another university event, you must contact me well in advance of the examination. In case of an extreme emergency, contact me before the scheduled examination. Failure to do so may result in an examination grade of zero. There are no exemptions for the final examination and no changes in taking the final examination. All students must take the final exam. A zero on the final exam will result in an F in the course.

Check the final examination time. If the final examination time is a problem, you need to drop this course. Once the first person has left the room on the day of an examination, no one else will be permitted to begin the exam.

**Assignment Policy:** All assignments are due at the announced time on the specified due date. Assignments will not be accepted late. If you have a conflict, please contact me in advance. You should turn in your homework assignments done neatly, clearly, and to the best of your ability. Follow all the instructions given. You will lose points for failure to follow instructions. Any work turned in to my box should be dated and timed by the CSC department staff. Please ask nicely. DO NOT slide any work under my office door or under the door to the Computer Science offices. PLEASE NOTE: You may be given assignments during the last five class days of the semester.

**Software Policy:** Disciplinary action will be taken against individuals who perform unauthorized duplication of software or who are involved in the unauthorized use of duplicated software. Such action may make it impossible for you to successfully complete this course.

**Computer Laboratory Usage:** Students utilizing equipment in university computing laboratories are expected to read and abide by all posted policies for the laboratories. Please note that no children and no pets are permitted in university computing laboratories.

**Drop Policy (Univ.):** The official university add/drop policy is located at: http://www.sfasu.edu/policies/add_drop.asp. If you have questions concerning registration, add/drop or the withdraw process, contact the Registrar at (936) 468-2501 or E-mail: REGISTRAR@SFASU.EDU. The Registrar is located on the 2nd floor of the Rusk building.

**Special Accommodation Requests:** To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/

Students with special accommodation requests have the responsibility to immediately initiate a meeting with the instructor to discuss how the special accommodations will be provided. Students who are aware of these special needs at the beginning of the semester must inform the instructor in person before the twelfth class day about any class activity, which will require special accommodations.

**Computer Account Policy:** All assignments that require the use of the University Computer must be done under the computer account that is assigned to you in this class. You should NOT do assignments from this class in other accounts. Failure to abide by the above statements will mean that you will received a grade of F in this course.

**Academic Integrity:** All instances of academic dishonesty will be reported to Office of the Dean of the student’s major. The report shall be part of the student’s record and shall remain on file with the Dean’s office for at least four years. Instances of academic dishonesty may also be reported to the University Committee on Academic Integrity. Students who wish to appeal decisions related to academic integrity will follow procedures outlined in University policy A-9.1. If in the instructor’s judgment an instance of academic dishonesty on an examination has occurred, a grade of zero will be assigned as the examination grade and a minimum of one (1) letter grade will be lost in the course grade. Possession of a cell phone or other electronic communication device during an exam will result in an examination grade of zero. A course grade of F may be assigned depending on the situation. A student found cheating on an examination may not drop the course. If a student is judged to be cheating on any part of a homework assignment or quiz, the student will receive negative points equal to the value of the entire homework/quiz. A negative grade will not be replaced by any possible bonus assignment. Both person who did the work (homework, quiz, test) and the person copying the work will be considered as cheating. A recurrence of this by any individual will result in a grade of F in the course. DO YOUR OWN WORK!!!!! Do NOT show your code to other students!!!
Acceptable Student Behavior

Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic, or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topic</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tuesday, August 24, 2021</td>
<td>Introduction, Review Syllabus, policies, schedule, D2L, e-mail</td>
<td>Read Chapter 1/Slides</td>
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<tr>
<td></td>
<td>Thursday, August 26, 2021</td>
<td>Chapter 1 - Introduction</td>
<td>Quiz1: Chapter 1</td>
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<tr>
<td>2</td>
<td>Tuesday, August 31, 2021</td>
<td>Chapter 2 – Data Representation in Computer Systems</td>
<td>Read Chapter 2/Slides</td>
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<td></td>
<td>Thursday, September 2, 2021</td>
<td>Quiz1: Chapter 2</td>
<td>Read 2</td>
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<tr>
<td>3</td>
<td>Tuesday, September 7, 2021</td>
<td>Chapter 2 – Data Representation in Computer Systems</td>
<td>Read 2</td>
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<tr>
<td></td>
<td>Thursday, September 9, 2021</td>
<td>Chapter 2 – Data Representation in Computer Systems</td>
<td>HW1: Chapter 2, Read 2</td>
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<tr>
<td>4</td>
<td>Tuesday, September 14, 2021</td>
<td>Chapter 3 – Boolean Algebra and Digital Logic</td>
<td>Quiz2: Chapter 2, Read 2</td>
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<td></td>
<td>Thursday, September 16, 2021</td>
<td>Read Chapter 3/Slides</td>
<td>Quiz3: Chapter 3, Read 3</td>
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<td>5</td>
<td>Tuesday, September 21, 2021</td>
<td>Chapter 3 – Boolean Algebra and Digital Logic</td>
<td>Quiz4: Chapter 4, Read 5, Quiz4: Chapter 4</td>
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<tr>
<td></td>
<td>Thursday, September 23, 2021</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>HW2: Chapter 3, Read 3</td>
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<td>6</td>
<td>Tuesday, September 28, 2021</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>Read Chapter 4/Slides</td>
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<td></td>
<td>Thursday, September 30, 2021</td>
<td>Exam 1 – Chapters 1, 2, 3</td>
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<td>7</td>
<td>Tuesday, October 5, 2021</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>Read 4</td>
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<td></td>
<td>Thursday, October 7, 2021</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>HW3: Chapter 4, Read 4</td>
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<td>8</td>
<td>Tuesday, October 12, 2021</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>Read 4, HW4 Chapter 4</td>
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<td></td>
<td>Thursday, October 14, 2021</td>
<td>Chapter 5 – Instruction Set Architectures</td>
<td>HW5: Chapter 4, Read 5, Quiz4: Chapter 4</td>
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<td>9</td>
<td>Tuesday, October 19, 2021</td>
<td>Chapter 5 – Instruction Set Architectures</td>
<td>Read Chapter 5/Slides</td>
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<td></td>
<td>Thursday, October 21, 2021</td>
<td>Chapter 5 – Instruction Set Architectures</td>
<td>Quiz5: Chapter 5,</td>
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<td>10</td>
<td>Tuesday, October 26, 2021</td>
<td>Chapter 6 – Memory</td>
<td>Read Chapter 6/Slides</td>
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<td></td>
<td>Thursday, October 28, 2021</td>
<td>Chapter 6 – Memory</td>
<td>HW6: Chapter 6, Read 6</td>
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<td>11</td>
<td>Tuesday, November 2, 2021</td>
<td>Chapter 6 – Memory</td>
<td>Quiz6: Chapter 6, Read Chapter 7/Slides</td>
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<td></td>
<td>Thursday, November 4, 2021</td>
<td>C programming examples and pointers</td>
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<td>12</td>
<td>Tuesday, November 9, 2021</td>
<td>In Class C programming exercise</td>
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<td></td>
<td>Thursday, November 11, 2021</td>
<td>Exam 2 – Chapters 4, 5, 6</td>
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<td>13</td>
<td>Tuesday, November 16, 2021</td>
<td>Chapter 7 – Input/Output and Storage Systems</td>
<td>HW7: Chapter 7, Read 7</td>
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<td>Thursday, November 18, 2021</td>
<td>Chapter 7 – Input/Output and Storage Systems</td>
<td>Quiz7: Chapter 7, Read 7</td>
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<tr>
<td>14</td>
<td>Tuesday, November 23, 2021</td>
<td>Thanksgiving Break</td>
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<td></td>
<td>Thursday, November 25, 2021</td>
<td>Thanksgiving Break</td>
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<td>15</td>
<td>Tuesday, November 30, 2021</td>
<td>Chapter 8 – System Software</td>
<td>HW8: Chapter 8, Read 8</td>
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<td>Tuesday, November 30, 2021</td>
<td>Chapter 9 – Alternative Architectures RISC CISC etc.</td>
<td>Quiz8: Chapter 8, Read 8</td>
</tr>
<tr>
<td>16</td>
<td>Tuesday, December 7, 2021</td>
<td>Final Exam Comprehensive 10:30 AM - 12:30 PM</td>
<td>STEM 314 OR/AND ONLINE</td>
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</tbody>
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