CSC 214 - 001
COMPUTER ORGANIZATION AND ARCHITECTURE
Fall 2018

Instructor: Dr. Pushkar Ogale
Department of Computer Science
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Office: 312D STEM
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PREREQUISITE: CSC 202

CLASS INFO: 
Credit Hours: 3
Meeting time: 1:00 – 2:15 PM MW
Location: STEM 318

OFFICE HOURS: 10:00 AM – 12:00 Noon  Monday, Wednesday
2:00 PM – 4:00 PM  Tuesday, Thursday  
(Other times by appointment only)

COURSE 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.

COURSE INTENT: 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://cs.sfasu.edu/cs/pdf/syll_214.pdf


GRADING CRITERIA: Overall grade will be based on the performance on the following components
1) Attendance - 5% Bonus for full attendance only
2) Quizzes - 10%
3) Assignments/Project - 30%
4) Examination 1 - 15%
5) Examination 2 - 15%
6) Final Examination - 30%

EXAMINATIONS: (60% of the course grade) – multiple choice, short answer, problems, programs
Exam 1 15%
Exam 2 15%
Final Examination – Comprehensive 30%

NOTE: 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.

ASSIGNMENTS: Class assignments (HW and Lab assignments) will total 30% of the course grade

ATTENDANCE: Attendance and constructive class participation – expected. Students who have full attendance except for one unexcused absence will qualify for 5% bonus grade. 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.

QUIZ: There will be 8 - 10 total Quizzes as per the schedule (tentative) and will constitute 10% of course grade.
COURSE CALENDAR: 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.

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. Describe the operation of performance enhancements such as pipelines, dynamic scheduling, branch prediction, and caches.
7. Explore operating system kernel interactions with the memory, I/O, peripherals, and bus system components.
8. 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.
9. Demonstrate skills in problem analysis and program design.

CONTENT: The following topics with estimated hours spent on each is listed below:
- Bits, data types, operations (6)
- Digital Logic Structures (6)
- Computer structures, functions, interconnection (11)
- Input and output in interfacing and communications (4)
- Machine issues and concepts (6)
- Memory Systems Organization (3)
- RISC and Multiprocessor architectures (3)
- High-level language utilization of hardware components (3)
- Exams (4)

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://cs.sfasu.edu/cs/plo/
- Students majoring in the College of Business may access program learning outcomes at http://www.sfasu.edu/cob/ug-plo.asp.

C L A S S   I N F O R M A T I O N   A N D   P O L I C I E S

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
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 other class assignments in this account, and 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: 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.

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. All instances of academic dishonesty will be reported to Office of the Dean of the student’s major. This report shall be made 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. A student who wishes to appeal decisions related to academic integrity follows procedures outlined in University policy A-9.1. Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

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!!!

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.

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>Monday, August 27, 2018</td>
<td>Introduction, Review Syllabus, policies, schedule, D2L, e-mail</td>
<td>Read Chapter 1/Slides</td>
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<td></td>
<td>Wednesday, August 29, 2018</td>
<td>Chapter 1 - Introduction</td>
<td>Read 1</td>
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<td>2</td>
<td>Monday, September 3, 2018</td>
<td>Chapter 1 - Introduction</td>
<td>Quiz1: Chapter 1</td>
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<td></td>
<td>Wednesday, September 5, 2018</td>
<td>Chapter 1 - Introduction</td>
<td>Read Chapter 2/Slides</td>
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<tr>
<td>3</td>
<td>Monday, September 10, 2018</td>
<td>Chapter 2 – Data Representation in Computer Systems</td>
<td>Read 2</td>
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<tr>
<td></td>
<td>Wednesday, September 12, 2018</td>
<td>Chapter 2 – Data Representation in Computer Systems</td>
<td>HW1: Chapter 2, Read 2</td>
</tr>
<tr>
<td>4</td>
<td>Monday, September 17, 2018</td>
<td>Chapter 2 – Data Representation in Computer Systems</td>
<td>Quiz2: Chapter 2, Read 2</td>
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<td></td>
<td>Wednesday, September 19, 2018</td>
<td>Chapter 3 – Boolean Algebra and Digital Logic</td>
<td>Read Chapter 3/Slides</td>
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<td>5</td>
<td>Monday, September 24, 2018</td>
<td>Chapter 3 – Boolean Algebra and Digital Logic</td>
<td>Quiz3: Chapter 3, Read 3</td>
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<tr>
<td></td>
<td>Wednesday, September 26, 2018</td>
<td>Chapter 3 – Boolean Algebra and Digital Logic</td>
<td>HW2: Chapter 3, Read 3</td>
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<td>6</td>
<td>Monday, October 1, 2018</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>Read Chapter 4/Slides</td>
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<td>Wednesday, October 3, 2018</td>
<td>Exam 1 – Chapters 1, 2, 3</td>
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<td>7</td>
<td>Monday, October 8, 2018</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>Read 4</td>
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<td>Wednesday, October 10, 2018</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>Monday, October 15, 2018</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>Read 4</td>
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<td></td>
<td>Wednesday, October 17, 2018</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>HW4 Chapter 4, Quiz4: Chapter 4</td>
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<td>9</td>
<td>Monday, October 22, 2018</td>
<td>Chapter 5 – Instruction Set Architectures</td>
<td>Read Chapter 5/Slides</td>
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<td>Wednesday, October 24, 2018</td>
<td>Chapter 5 – Instruction Set Architectures</td>
<td>HW5: Chapter 4, Read 5</td>
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<td>10</td>
<td>Monday, October 29, 2018</td>
<td>Chapter 6 – Memory</td>
<td>Quiz5: Chapter 5, Read Chapter 6/Slides</td>
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<td>Wednesday, October 31, 2018</td>
<td>Chapter 6 – Memory</td>
<td>HW6: Chapter 6, Read 6</td>
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<td>11</td>
<td>Monday, November 5, 2018</td>
<td>Chapter 7 – Input/Output and Storage Systems</td>
<td>Quiz6: Chapter 6, Read Chapter 7/Slides</td>
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<td>Wednesday, November 7, 2018</td>
<td>Chapter 7 – Input/Output and Storage Systems</td>
<td>HW7: Chapter 7, Read 7</td>
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<td>12</td>
<td>Monday, November 12, 2018</td>
<td>Chapter 7 – Input/Output and Storage Systems</td>
<td>Quiz7: Chapter 7, Read 7</td>
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<td>Wednesday, November 14, 2018</td>
<td>Exam 2 – Chapters 4, 5, 6, 7</td>
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<td>13</td>
<td>Monday, November 19, 2018</td>
<td>Thanksgiving Holiday</td>
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<td>14</td>
<td>Monday, November 26, 2018</td>
<td>Chapter 8 – System Software</td>
<td>Read Chapter 8/Slides</td>
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<td>Wednesday, November 28, 2018</td>
<td>Chapter 8 – System Software</td>
<td>HW8: Chapter 8, Read 8</td>
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<td>15</td>
<td>Monday, December 3, 2018</td>
<td>Chapter 9 – Alternative Architectures RISC CISC etc.</td>
<td>Quiz8: Chapter 8, Read 8</td>
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<td>Wednesday, December 5, 2018</td>
<td>Review</td>
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<tr>
<td>16</td>
<td>Monday, December 10, 2018</td>
<td>Final Exam Comprehensive 1:00 PM - 3:00 PM</td>
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