Computer Architecture
CSC 343 001

Greg T. Harber
Department of Computer Science
Nelson Rusche College of Business
McGee 303B
gth@cs.sfasu.edu
468-1867, 468-2508

Office Hours

<table>
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<tr>
<th>Day</th>
<th>Time</th>
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<tbody>
<tr>
<td>Monday</td>
<td>10:30 - 11:30</td>
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<td>Tuesday</td>
<td>08:30 - 09:30</td>
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<td>Wednesday</td>
<td>10:30 - 11:30</td>
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<td>Thursday</td>
<td>08:30 - 09:30</td>
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<td>Friday</td>
<td>10:30 - 11:30</td>
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Other times by appointment.

Class meeting time and place

11:00 am-12:15 pm on Tuesday and Thursday
R.E. McGee Business Building
Room 343

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 operating system.

Prerequisites

CSC 214; CSC 241 recommended.

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. You may access the program learning outcomes for your major and particular courses at http://cobweb.sfasu.edu/plo.html.
**Student Learning Outcomes**

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

1. Describe the basic principles of computer architecture and organization and what influences the performance of the system.
2. Employ the fundamentals of system level programming.
3. 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.
4. Determine instruction design and implementation requirements.
5. Assess the effect of CPU architecture on application performance and how to improve application performance.
6. Describe some modern architectures such as RISC, Superscalar, VLIW (very large instruction word).
7. Describe the operation of performance enhancements such as pipelines, dynamic scheduling, branch prediction, and caches.
8. Describe the principles of computer design.
9. Identify the relationship between high-level abstractions and low-level hardware components.
10. Explain operating system kernel interactions with the memory, I/O, peripherals, and bus system components.

**Required Materials**

ISBN: 0-13-608860-0

**Course Requirements**

**Examinations:** (75% of the course grade)

Two or three regular examinations plus a comprehensive final. The final exam counts double. NOTE: There are NO exemptions from the final examination.

**Assignments:**

Assignments, unannounced quizzes, and attendance are 10% of the total grade.
Programs/labs are 15% of the total grade.

**Course Calendar/Timeline**

Computer Architecture ................................................................. . 24 hours
Functions of, and communication between, large-scale components of a computer system.
Hardware implementation and sequencing of instruction fetch, address construction, and instruction execution.
Data flow and control block diagrams of a simple processor.
Concept of microprogram and analogy with software.
Properties of simple I/O devices and their controllers, synchronous control, interrupts.
Modes of communications between processor, memory, bus, and peripheral devices.
Study of an actual microcomputer system.
Introduction to advanced architectures.

Architecture and Operating System Interaction ................................................. 18 hours
Role of operating system kernel in controlling the large-scale components of a computer
system.
Resource abstractions related to hardware components.
Resource, memory, device, and file management.
Using kernel services and interrupts.
Virtual memory operations.

Exams (plus final) ..................................................................................... 3 hours

Class Information and Policies

Attendance & Class Behavior:

Seating assignments will be made and roll will be taken regularly. Attendance will be used in
calculating your final grade. If you come to class, you are expected to be present the entire
class period unless you have been given permission to leave early. If you are absent from
class please do not come by my office and ask me to repeat the class lecture. There will be
no smoking, no chewing of tobacco, no eating or drinking, and no bare feet. Please keep your
feet off the seat backs. 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. Cell phones and pagers should be turned off for the duration of the class.
Only students officially registered for the course and approved assistants may attend class.

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 will
result in an examination grade of zero. A grade of zero will be assigned for any missed
unannounced quizzes.

Assignment Policy:

All assignments are due at the BEGINNING of class (or by an announced time) on the
specified due date. That means, any assignment given to me after I have collected the
assignments from the class is considered to be late. As much as 100% of the total credit may
be deducted from assignments that are handed in late. Under NO circumstances will any
assignment be accepted for credit after the collected class assignments have been graded.
PLEASE NOTE: You may be given assignments during the last five class days of the
semester.
University Drop Policy:

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.

Computer Account Policy:

All assignments that require the use of the University Computer must be done using 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 receive a grade of F in this course.

Software Policy:

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

Cheating Policy:

If in my judgment a student is found cheating on an examination, 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. A course grade of F may be assigned depending on the situation. All other class assignments are to be done INDEPENDENTLY. If in my judgment two or more people hand in assignments that I judge to be the same, the point value for that homework assignment will be deducted from the homework grade of all involved students and a minimum of one letter grade may be lost in the course grade. A recurrence of this by any individual will result in a grade of F in the course. Students should save all developmental copies of their programs/assignments so that individual program/assignment development can be verified to me if I think it is necessary. DO YOUR OWN WORK!!!!! Do NOT show other students your code!!!!

Computing Laboratory Usage:

Students who utilize 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.

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. You may access the program learning outcomes for your major and particular courses at http://cobweb.sfasu.edu/plo.html.
General Student Policies:

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/.

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.