CSCI 2314 - 001
Computer Organization and Architecture
Fall 2023

Instructor Name: Eddie Ironsmith M.S.
Email: Eddie.Ironsmith@sfasu.edu
Phone: (936) 468-1619
Department: Computer Science
Office: 312C STEM

Office Hours: M 9:00 AM – 10:00 AM
T, Th 8:30 AM – 9:30 AM
T, Th 3:15 PM – 4:15 PM
(Other times by appointment)

GTA Office Hours: MWF 12pm-1pm, M-F 11am - 12pm, and M-F 5-7pm (in STEM 320)

Class meeting: Time: 2:00 PM – 3:15 PM T, Th
Place: STEM 417

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

Course Description: Fundamental concepts of computer systems, systems software, and an overview of computer science issues. Problem solving and program development using a high-level programming language.

Official Course Syllabus:
For additional detail including course description, purpose of course, student learning objectives, credit hour statement, and content, see the official course syllabus here: http://sfasu.edu/docs/computer-science/undergraduate-course-CSCI2314.pdf

Student Learning Outcomes:
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 Hours
Introduction to Computer Science ..................................................................................................................1

Basic Concepts of Computer Systems.........................................................................................................2
  Architectural overview
  Data storage and representation
  Computing environments
  Computer languages

Systems Software ............................................................................................................................................5
  Operating systems, editors, compilers
  Program linking, loading, and execution

Problem Solving Concepts ..........................................................................................................................9
  Strategies for problem solving
  Algorithm representation

Program Development ..................................................................................................................................20
  Use of a high-level programming language to solve simple problems on a computer
  programming language concepts and features: primitive data types, expressions and operations,
  functions and parameters, fundamental control structures, one-dimensional arrays, text files

Software Engineering Principles....................................................................................................................3
  Life Cycle and Development Process
  Modular design and communication
  Documentation

Ethics and Careers.......................................................................................................................................2

Exams............................................................................................................................................................3
TOTAL 45 (Approximately 150 minutes of instruction will be asynchronous.)

Academic Integrity (4.1)
The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff, and students to adhere to and uphold this policy.

Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not
authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

**AI use:** Work submitted for grading must be your own. Use of AI-generated material for homework, quizzes, or exams is a violation of SFA’s academic integrity policy (see Plagiarism above).

**Withheld Grades Semester Grades Policy (5.5)**

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 coursework 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 to compute the grade point average. For additional information, go to [https://www.sfasu.edu/policies/course-grades-5.5.pdf](https://www.sfasu.edu/policies/course-grades-5.5.pdf).
**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/](http://www.sfasu.edu/disabilityservices/).

**Student Wellness and Well-Being**
SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc.

If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

**On-campus Resources:**
**The Dean of Students Office** (Rusk Building, 3rd floor lobby)
[www.sfasu.edu/deanofstudents](http://www.sfasu.edu/deanofstudents)
936.468.7249
dos@sfasu.edu

**SFA Human Services Counseling Clinic** Human Services, Room 202
[www.sfasu.edu/humanservices/139.asp](http://www.sfasu.edu/humanservices/139.asp)
936.468.1041

**The Health and Wellness Hub** “The Hub”
Location: corner of E. College and Raguet St.

To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:
- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education

[www.sfasu.edu/thehub](http://www.sfasu.edu/thehub)
936.468.4008
thehub@sfasu.edu

**Crisis Resources:**
- Burke 24-hour crisis line: 1.800.392.8343
- National Suicide Crisis Prevention: 9-8-8
- Suicide Prevention Lifeline: 1.800.273.TALK (8255)
- johCrisis Text Line: Text HELLO to 741-741

**Schedule** -
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topic</th>
<th>Quiz/Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tuesday, August 29</td>
<td>Introduction, Review Syllabus, policies, schedule, D2L</td>
<td>D2L Introduction paragraph</td>
</tr>
<tr>
<td></td>
<td>Thursday, August 31</td>
<td>Chapter 1 - Introduction</td>
<td>Read Chapter 1/Slides</td>
</tr>
<tr>
<td>2</td>
<td>Tuesday, September 5</td>
<td>Chapter 1 - Introduction</td>
<td>Quiz: Chapter 1</td>
</tr>
<tr>
<td></td>
<td>Thursday, September 7</td>
<td>Chapter 2 – Data Representation in Computer Systems</td>
<td>Read Chapter 2/Slides</td>
</tr>
<tr>
<td>3</td>
<td>Tuesday, September 12</td>
<td>Chapter 2 – Data Representation in Computer Systems</td>
<td>Read 2</td>
</tr>
<tr>
<td></td>
<td>Thursday, September 14</td>
<td>Chapter 2 – Data Representation in Computer Systems</td>
<td>HW1: Chapter 2, Read 2</td>
</tr>
<tr>
<td>4</td>
<td>Tuesday, September 19</td>
<td>Chapter 3 – Boolean Algebra and Digital Logic</td>
<td>Quiz2: Chapter 2, Read 2</td>
</tr>
<tr>
<td></td>
<td>Thursday, September 21</td>
<td>Chapter 3 – Boolean Algebra and Digital Logic</td>
<td>Read Chapter 3/Slides</td>
</tr>
<tr>
<td>5</td>
<td>Tuesday, September 26</td>
<td>Chapter 3 – Boolean Algebra and Digital Logic</td>
<td>Quiz3: Chapter 3, Read 3</td>
</tr>
<tr>
<td></td>
<td>Thursday, September 28</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>HW2: Chapter 3, Read 3</td>
</tr>
<tr>
<td>6</td>
<td>Tuesday, October 3</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>Read Chapter 4/Slides</td>
</tr>
<tr>
<td></td>
<td>Thursday, October 5</td>
<td>Exam 1 – Chapters 1, 2, 3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Tuesday, October 10</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>Read 4</td>
</tr>
<tr>
<td></td>
<td>Thursday, October 12</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>HW3: Chapter 4, Read 4</td>
</tr>
<tr>
<td>8</td>
<td>Tuesday, October 17</td>
<td>Chapter 4 – MARIE: An introduction to a Simple Computer</td>
<td>Read 4, HW4 Chapter 4</td>
</tr>
<tr>
<td></td>
<td>Thursday, October 19</td>
<td>Chapter 5 – Instruction Set Architectures</td>
<td>Read 5, Quiz4: Chapter 4</td>
</tr>
<tr>
<td>9</td>
<td>Tuesday, October 24</td>
<td>Chapter 5 – Instruction Set Architectures</td>
<td>Read Chapter 5/Slides</td>
</tr>
<tr>
<td></td>
<td>Thursday, October 26</td>
<td>Chapter 5 – Instruction Set Architectures</td>
<td>Quiz5: Chapter 5</td>
</tr>
<tr>
<td>10</td>
<td>Tuesday, October 31</td>
<td>Chapter 6 – Memory</td>
<td>Read Chapter 6/Slides</td>
</tr>
<tr>
<td></td>
<td>Thursday, November 2</td>
<td>Chapter 6 – Memory HW6</td>
<td>Read Chapter 6,</td>
</tr>
<tr>
<td>11</td>
<td>Tuesday, November 7</td>
<td>Chapter 6 – Memory Quiz6</td>
<td>Chapter 6, Read</td>
</tr>
<tr>
<td></td>
<td>Thursday, November 9</td>
<td>C programming examples and pointers</td>
<td>Chapter 7/Slides</td>
</tr>
<tr>
<td>12</td>
<td>Tuesday, November 14</td>
<td>In Class C programming exercise</td>
<td>HW8 - C Programming</td>
</tr>
<tr>
<td></td>
<td>Thursday, November 16</td>
<td>Exam 2 – Chapters 4, 5, 6</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Tuesday, November 21</td>
<td>Thanksgiving Break</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thursday, November 23</td>
<td>Thanksgiving Break</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Tuesday, November 28</td>
<td>Chapter 7 – Input/Output and Storage Systems</td>
<td>HW7: Chapter 7, Read 7</td>
</tr>
<tr>
<td></td>
<td>Thursday, November 30</td>
<td>Chapter 7 – Input/Output and Storage Systems</td>
<td>Quiz7: Chapter 7, Read 7</td>
</tr>
<tr>
<td>15</td>
<td>Tuesday, December 5</td>
<td>Chapter 8 – System Software</td>
<td>HMW9: Review Only</td>
</tr>
<tr>
<td></td>
<td>Thursday, December 7</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 12</td>
<td>Final Exam Comprehensive 1:00 PM – 3:00 PM</td>
<td>STEM 417</td>
</tr>
</tbody>
</table>