

**CS 3803  
Computer Organization  
Spring 2016**

A detailed study of computer organization concepts and the components of a computer system including control unit, micro-programming, pipelining, memory hierarchy, cache design, virtual memory, I/O devices, and an introduction to parallel processors.

Prerequisites: A “C” or better in both CpE2210 and CS1510.

**Instructor:** A. R. Hurson hurson@mst.edu  
**Office:** 323 CS Building  
**Office Hours:**

**Text:** *Computer Organization, Design, and Architecture (5<sup>th</sup> edition)*, Sajjan Shiva

**Outline:**

1. Basic Components and Flow of Operations of computers
2. Register Transfer Logic and Register Transfer Language
3. Instruction Types, Formats and Addressing Modes
4. Study of a simple machine — Assembly and Machine Language
5. Study of MIPS — Assembly and Machine Language
6. Arithmetic Logic Unit
7. Control Unit
  - Hardwired
  - Micro-programmed
8. Performance metrics
  - Study of CISC
  - Study of RISC
9. Memory System
10. Input-Output Organization.
11. Introduction to Advanced Topics

**Administrative:**

10 Homeworks and project (s)	20%
Exams and quizzes	40%
Final Exam (Comprehensive)	35%
Active class participation	5%

I am expecting **class attendance** and **proactive class participation**

**Makeup examinations & Extensions**

There will be no makeup exams/quizzes (except for documented medical reason and highly unusual unexpected events).

**Exams**

There will be one exam for each course module during the semester and one comprehensive final exam during final exams week.

**Submission Guidelines**

Hardcopy of homework assignments and project(s) are collected in class,

It is encouraged to work as a group (at most two people per group) on homework assignments/project (grouping is fixed throughout the semester).

**Tentative course schedule CS3803**

<b>Major Topic</b>	<b>Related Text Chapter</b>	<b>Class notes</b>	<b>Date</b>
<b>Introduction</b>	Chapter 1	Module 1, page 1-15	Jan. 20
		Module 1, page 16-28	Jan. 22
<b>Test Module 1, Register Transfer Logic</b>	Chapter 4, sections 4.6-4.9	Module 2, page 1-11	Jan. 25
		Module 2, page 12-26	Jan. 27
		Module 2, page 27-36	Jan. 29
		Module 2, page 37-49	Feb. 1
<b>Test Module 2, Programming Level</b>	Chapters 5 and 8	Module 3, page 1-11	Feb. 3
		Module 3, page 12-24	Feb. 5
		Module 3, page 25-36	Feb. 8
		Module 3, page 37-47	Feb. 10
		Module 3, page 48-57	Feb. 12
		Module 3, page 58-76	Feb. 15
<b>Test Module 3, Arithmetic Logic Unit</b>	Chapters 8 and 10	Module 4, page 1-12	Feb. 17
		Module 4, page 13-21	Feb. 19
		Module 4, page 22-31	Feb. 22
		Module 4, page 32-43	Feb. 24
		Module 4, page 44-53	Feb. 26
		Module 4, page 54-62	Feb. 29
		Module 4, page 63-74	March 2
		Module 4, page 75-86	March 4
<b>Test Module 4, Control Unit</b>	Chapter 6	Module 5, page 1-10	March 7
		Module 5, page 11-20	March 9
		Module 5, page 21-30	March 11
		Module 5, page 31-37	March 14
<b>Catch up</b>			March 16
<b>No class</b>			<b>March 18</b>
<b>Test Module 5, Performance metrics</b>	Chapter 8	Module 6, page 1-10	March 21
RISC and CISC organizations		Module 6, page 11-20	March 23
		Module 6, page 21-30	March 25
<b>No class</b>	<b>Spring Break</b>		<b>March 27</b>
		Module 6, page 31-41	April 4
<b>Test Module 6, Improving the Performance and memory</b>	Chapters 9 and 11	Module 7, page 1-12	April 6
		Module 7, page 13-22	April 8
		Module 7, page 23-30	April 11
		Module 7, page 31-40	April 13
		Module 7, page 41-51	April 15
		Module 7, page 52-61	April 18
		Module 7, page 62-71	April 20
	Module 7, page 72-85	April 23	
<b>Test Module 7, MIPS</b>		Module 8, page 1-9	April 25
		Module 8, page 10-22	April 27
		Module 8, page 23-31	April 29
		Module 8, page 32-39	May 2
<b>Test Module 8</b>			May 4

## Course Policies

Missouri University of Science and Technology is committed to the safety and well-being of all members of its community. US Federal Law Title IX states that no member of the university community shall, on the basis of sex, be excluded from participation in, or be denied benefits of, or be subjected to discrimination under any education program or activity. Furthermore, in accordance with Title IX guidelines from the US Office of Civil Rights, Missouri S&T requires that all faculty and staff members report, to the Missouri S&T Title IX Coordinator, any notice of sexual harassment, abuse, and/or violence (including personal relational abuse, relational/domestic violence, and stalking) disclosed through communication including but not limited to direct conversation, email, social media, classroom papers and homework exercises.

Missouri S&T's Title IX Coordinator is Vice Chancellor Shenethia Manuel. Contact her directly ([manuel@mst.edu](mailto:manuel@mst.edu); (573) 341-4920; 113 Centennial Hall) to report Title IX violations. To learn more about Title IX resources and reporting options (confidential and non-confidential) available to Missouri S&T students, staff, and faculty, please visit <http://titleix.mst.edu>.

- **Academic Alert System** <http://academicalert.mst.edu>

The purpose of the [Academic Alert System](http://academicalert.mst.edu) is to improve the overall academic success of students by improving communication among students, instructors and advisors; reducing the time required for students to be informed of their academic status; and informing students of actions necessary by them in order to meet the academic requirements in their courses.

- **Disabilities** <http://dss.mst.edu>

If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with the instructor as early as possible in the semester. You will need to request that the [Disability Support Services](#) staff send a letter to the instructor verifying your disability and specifying the accommodation you will need before the instructor can arrange your accommodation. Disability Support Services is located in 204 Norwood Hall, their phone number is 341-4211, and their E-mail is [dss@mst.edu](mailto:dss@mst.edu).

- **A Student Honor Code and Academic Integrity**

The Honor Code can be found at this link: <http://stuco.mst.edu/about/honor.shtml>. Please read and reflect upon the Honor code and its emphasis on HONESTY and RESPECT.

Page 30 of the Student Academic Regulations handbook describes the student standard of conduct relative to the University of Missouri System's Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism or sabotage (<http://registrar.mst.edu/academicregs/index.html>).

Incidences of Academic Dishonesty will typically result in zero grades for the respective course components, notification of the student's advisor, the student's department chair, and the campus undergraduate studies office, and further academic sanctions may be imposed as well in accordance with the regulations. Note that those who allow others to copy their work are just as guilty of plagiarism and will be treated in the same manner.

- **S&Tconnect:** <https://blackboard.mst.edu/> (S&Tconnect tab)

S&Tconnect provides an enhanced system that allows students to request appointments with their instructors and advisors via the S&Tconnect calendar, which syncs with the faculty or staff member's Outlook Exchange calendar. S&Tconnect will also facilitate better communication overall to help build student academic success and increase student retention. S&Tconnect Early Alert has replaced the Academic Alert system used by Missouri S&T. If training is needed, please contact Rachel Morris at [rachelm@mst.edu](mailto:rachelm@mst.edu) or 341-7600.

- **Classroom Egress Maps:**

Please familiarize yourself with the classroom egress maps posted on-line at: <http://registrar.mst.edu/links/egress/>.

- **LEAD Learning Assistance** <http://lead.mst.edu>

The Learning Enhancement Across Disciplines Program (LEAD) sponsors free learning assistance in a wide range of courses for students who wish to increase their understanding, improve their skills, and validate their mastery of concepts and content in order to achieve their full potential. LEAD assistance starts no later than the third week of classes. Check out the online schedule at <http://lead.mst.edu/assist>, using zoom buttons to enlarge the view. Look to see what courses you are taking have collaborative LEAD learning centers (bottom half of schedule) and/or Individualized LEAD tutoring (top half of the schedule). For more information, contact the LEAD office at 341-7276 or email [lead@mst.edu](mailto:lead@mst.edu).

- **The Burns & McDonnell Student Success Center**

The Student Success Center is a centralized location designed for students to visit and feel comfortable about utilizing the campus resources available. The Student Success Center was developed as a campus wide initiative to foster a sense of responsibility and self-directedness to all S&T students by providing peer mentors, caring staff, and approachable faculty and administrators who are student centered and supportive of student success. Visit the B&MSSC at 198 Toomey Hall; 573-341-7596; [success@mst.edu](mailto:success@mst.edu); facebook: [www.facebook.com/mstssc](http://www.facebook.com/mstssc); web: [www.studentsuccess.com](http://www.studentsuccess.com).