Course Syllabus – CSC 204 – Introduction to Computer Organization

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Office Hours: 11:00-12:00 (MW) + 1:00-3:00 (TTh) + by appointment

Status within the Curriculum
Required

Course Description
This class will introduce students to the fundamentals of logic design and structure of computer hardware components, and the mechanics of information transfer and control within a digital computer system.

Course Prerequisite(s)
1. CSC 102 --- Firm Requirement. If you haven't scored C or better in CSC 102 already, you are not ready for this course.

Textbook & Other Course Information
The textbook is:

The textbook will be followed somewhat closely. Most of the material between chapters 2 and 12 will be covered. In addition, a freely available software, “Digital Works” will be required. You can find a download link for version 3.0.5.0 at: https://en.freedownloadmanager.org/Windows-PC/Digital-Works.html  
This software is meant to run on Windows versions up to 8. If you use a different system, you may need to create a VM first.

Additional course material may be posted on the class website:  
http://www.cs.usm.edu/~banerjee/CSC204 (The URL is case-sensitive)

Various notifications and ungraded weekly reading assignments will also be posted on this website, so that you can prepare for a class. So be sure to check this URL often.

Attendance
You should do your best to attend every class. Knowledge presented in class will be critical for passing the midterm and final; the textbook may not be sufficient. In addition, pop quizzes (most likely at the very beginning of class) based on the week’s readings are always a possibility. If you skip a class, or are late, you may miss a quiz, unless prior arrangements are made with the instructor.

Email Policy
If you send me any email, you must include your full name in the email, and mention “CSC 204” on the subject line. I may not respond to your email if you fail to do so.
Behavior in Class
You are NOT allowed to use any electronic devices in class, without permission. You must NOT leave while
the class is in session without permission. If you have anything to say, it must be addressed to the instructor;
you must NOT talk amongst yourselves. Any violation will automatically earn a fail-grade.

This policy is not meant to discourage questions about the class materials. You must ask as many
questions about the material as you need to.

Assignments & Workload
There will be several homeworks, in addition to quizzes, a midterm, and a final. The workload will be
targeted to roughly 6 to 8 hours per week outside of class.

Grading
30% Homeworks/Assignments
20% Quizzes
25% Midterm
25% Final

Late assignments will be penalized by 20% per calendar day, except for extreme circumstances. If possible,
give the instructor advance notice of any problems.

Extra credit may be offered periodically, so take advantage of it when it arises. There will not be extra credit
available toward the end of the course, so plan accordingly. In order to get a good distribution of grades, it
might be necessary to apply a scale or curve.

All paper assignments must be stapled. Dog-eared assignments will not be accepted.

Tentative Topics
1. **Introduction**: Introduction to computer organization, distinction with computer architecture, history of computing
2. **Basic Digital Logic**: Analog vs. digital circuits, Gates, Boolean logic, theorems of Boolean algebra,
simple combinational circuits, function simplification and Karnaugh maps, Programmable Logic Arrays,
use of the Digital Works software
3. **Error Detection and Correction**: Single parity, 2D parity, Hamming code, CRC
4. **Sequential Logic**: Flip-flops (RS, JK, D), characteristic tables and excitation tables, clocking flip-flops
and timing diagrams, register operations, synchronous and asynchronous counters, sequence generators,
memory module circuits
5. **Computer Arithmetic**: Number systems in different bases, conversions among bases, base’s
complement (2’s complement) and integer arithmetic operations (addition, subtraction, and
multiplication), overflow and underflow, half and full adder circuits, the IEEE floating point format,
design of a simple ALU for a given set of arithmetic & logic operations
6. **Structure of the CPU**: Register transfer language, address and data paths, bus and tri-state logic,
assembly instruction format including conditional instructions, addressing modes, fetch-decode-execute
cycle, pipelining, RISC vs. CISC
7. **Input/Output**: Programmed I/O, Direct Memory Access, Interrupt Driven I/O including masking
8. **Miscellaneous**: Micro-programmed control unit, control word format and design for a given instruction
set. Cache memory and speedup, direct and associative mapped cache
Special Accommodations

If a student has a disability that qualifies under the Americans with Disabilities Act (ADA) and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies.

Address:
The University of Southern Mississippi
Office for Disability Accommodations
118 College Drive # 8586
Hattiesburg, MS 39406-0001

Voice Telephone: 601.266.5024 or 228.214.3232
Fax: 601.266.6035
Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1.800.582.2233 (TTY) or emailing ODA at oda@usm.edu.

Academic Integrity

Students are encouraged to collaborate in preparing for tests or quizzes, and even for homeworks or assignments. However, the final work submitted must be the student's own work. Whenever you collaborate for an assignment or a programming project, you must declare the names of all collaborators in the team, and the percentage effort of every team member including yourself. No collaboration will be allowed during quizzes or tests.

All students at the University of Southern Mississippi are expected to demonstrate the highest levels of academic integrity in all that they do. Forms of academic dishonesty include (but are not limited to):

1. Cheating (including copying from others’ work). Blind use of online solution manual falls in this category, and will be prosecuted severely.
2. Plagiarism (representing another person’s words or ideas as your own; failure to properly cite the source of your information, argument, or concepts).
3. Falsification of documents
4. Disclosure of test or other assignment content to another student
5. Submission of the same paper or other assignment to more than one class without the explicit approval of all faculty members’ involved
6. Unauthorized / undeclared academic collaboration with others
7. Conspiracy to engage in academic misconduct

Engaging in any of these behaviors or supporting others who do so will result in academic penalties and/or other sanctions. If I determine that a student has violated our Academic Integrity Policy, the first occurrence will be sanctioned with 0 credit for the entirety of that work, and the second occurrence will result in a grade of “XF” for the course, which will be on the student’s transcript with the notation “Failure due to academic misconduct.”

For more details, please see the University’s Academic Integrity Policy (https://www.usm.edu/institutional-policies/policy-acaf-pro-012%20). Also check out the website: https://www.usm.edu/provost/students-guide-academic-integrity. Note that repeated acts of academic misconduct will lead to expulsion from the University.