Course Description

Instruction sets, assembly language and assemblers, linkers and loaders, data representation and manipulation, interrupts, pointers, function calls, argument passing, and basic gate-level digital logic design.

Course Topics:

Computer organization, Number representation, programming a computer, assemblers, linker, loader, MIPS assembly language programming, run time memory stack, interrupt & exceptions, Boolean algebra, integer mathematics, logic gates & logic design.

Course Objectives:

To get introduced to the organization of a computer system

To get familiarized with instruction sets and assembly programming

To experience extensive programming practice that reinforces binary data representation, assembly instructions, addressing modes, and run time stack organization

To get extensive lab practice using computer simulation.

To appreciate how the computer hardware supports systems programming and high-level languages

Learning Outcomes and Course Goals

Course Goal:

The course consists of an introduction to computer hardware organization and the hardware/software interface. Programming assignments are used to reinforce concepts of data representation, addressing modes, memory organization, run time stacks, and interfacing with high-level languages.

Course Learning Outcomes (CLO):

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

To be familiar with the architectural components of a computer system: CPU (registers, ALU), memory, buses

To be able to convert between decimal, binary, and hexadecimal notations.

To work with two's complement integers, floating-point numbers, and character encodings

To be able to write assembly programs that use load/store, arithmetic, logic, branches, call/return and push/pop instructions.

To understand the gate-level operations of basic ALU

BS in Computer Science Program Outcomes Supported:

These are the BSCS Program Outcomes supported by this course:

a) An ability to apply knowledge of computing and mathematics to solve problems.

b) An ability to analyze a problem, to identify and define the computing requirements appropriate to its solution

c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs

i) An ability to use current techniques, skills, and tools necessary for computing practice.

j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

Required Texts/Readings

Textbook

COMPUTER ORGANIZATION and DESIGN | Edition: 5
Author: DAVID A. PATTERSON
ISBN:9780124077263
Publication Date:10/10/2013
Publisher:ELSEVIER

Other Readings

LOGIC & COMPUTER DESIGN FUNDAMENTALS
Author: MANO & KIME
ISBN: 9780131989269
Publication Date: 06/15/2007
Publisher: PEARSON

Other technology requirements / equipment / material

You will be **required** to bring a

Design and Implementation.
Testing
Conclusion
Make sure to

1. Include clear diagrams for requirement and design.
2. Include code snippet to explain implementation.
3. Include screen shots of testing results.
4. Upload source code and test program as zip archive.

Project reports are encouraged to be submitted in IEEE format.
[http://www.ieee.org/conferences_events/conferences/publishing/templates.html]

10% of the obtained marks in project will be awarded as extra points in project evaluation if report submitted in proper IEEE format.

LockDown Browser + Webcam Requirement

This course requires the use of LockDown Browser and a webcam for online quizzes. The webcam can be the type that's built into your computer or one that plugs in with a USB cable.

Watch this brief video to get a basic understanding of LockDown Browser and the webcam feature.

https://www.respondus.com/products/lockdown-browser/student-movie.shtml

Download Instructions
Download and install LockDown Browser from this link:

https://download.respondus.com/lockdown/download.php?id=967937270

Once Installed

Start LockDown Browser
Log into to Canvas
Navigate to the quiz

Note: You won't be able to access a quiz that requires LockDown Browser with a standard web browser. If this is tried, an error messa

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A+ = 100-97%	A = 96-93%	A- = 92-90%

B+ = 89-87% B = 86-83%

Course Schedule