TECHNOLOGY, INNOVATION & COMPUTER SCIENCE

LONG ISLAND UNIVERSITY, BROOKLYN CAMPUS

DEPARTMENT OF COMPUTER SCIENCE

**CS 641**

**Computer Architecture, 3 Credit Hours**

**Fall 2014**

1. INSTRUCTOR INFORMATION

Course: CS 641 – Fundamentals of Computer Science and Systems Programming

Section: 001

Instructor: Samir Iabbassen

Class Hours: Monday 6 pm - 8:35 pm

Office hours: Tuesday 5:00 pm - 6:00 pm

Telephone: 917 325 6855

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Blackboard: <http://blackboard.liu.edu/>

1. RESOURCES

Required Textbook:

Title: The Architecture of Computer Hardware, Systems Software, & Networking: An Information Technology Approach

Author: Irv Englander

ISBN: 978111832263

Publisher: WILEY

Edition: 5TH 14

1. INSTRUCTIONAL DESIGN

Course Description:

A study of computer architecture and organization, with emphasis on quantitative analysis. Boolean algebra is introduced to teach digital devices. Students are required to design and implement on paper a simple microprocessor by the end of the semester. Microprogramming and conventional machine level are taught. Programming is expected in an assembly programming language

Course Overview:

This Course provides students with a solid understanding of computer architecture and organization; understanding the various components of a computer and their interrelationships. Course topics include Boolean algebra, Hardware components, processor operation including fetch/execute, input/output, instruction types, interrupt handling, addressing schemes and multiprocessing; business systems software including operating systems from single-user single-task to multi-user multitask; major current operating systems; enterprise architecture. Some emphasis will be placed on hardware/software interaction to achieve performance.

At the end of this course, student will have the ability to implement and verify designs of varying complexity and write a detailed technical report to describe designs implemented at the register-transfer-level, explain the testing strategy used to verify functionality, and evaluate the designs to determine the superior approach.

Course Requirements: CS 601 or equivalent, and CS 605 or equivalent.

1. Course Learning Objectives:

* Identify, use and translate basic number systems, explain basic types of data formats, and describe fundamental digital logic and its relationship to binary numbers.
* Explain various ways for Data Representation – Fixed Point Numbers; Floating Point Numbers, Computer Arithmetic.
* Explain a basic instruction set and how it works, and describe the fetch-decode-execute instruction cycle.
* Describe and use the components of a CPU, input/output hardware and peripherals and how they work, and hierarchy of storage.
* Describe the functions of an operating system and be able to compare various types of operating systems, including file management, and memory management.
* Differentiate between high-level, low-level and machine computer languages (assembly language will be introduced).

1. GRADING CRITERIA, GUIDELINES, AND ASSIGNMENTS

* Class Participation & Attendance: 10%
* Assignments/ Quizzes: ~20%
* Midterm and/or Project: ~40%
* Final:~30%

1. **WEEKLY OUTLINE**

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| --- | --- | --- |
| **Schedule** | **Topics Covered** | **Assignments** |
| **Week 1** | An Introduction to System Concepts and Systems Architecture |  |
| **Week 2** | -Number Systems  -Data Formats | Homework 1 |
| **Week 3** | Representing Numerical Data | Homework 2 |
| **Week 4** | The CPU and Memory | Quiz 1 |
| **Week 5** | CPU and Memory: Design, Enhancement, and Implementation | Homework 3 |
| **Week 6** | Input /Output | Homework 4 |
| **Week 7** | Summary of previous topic | Term Paper Assignment |
| **Week 8** | Midterm Exam |  |
| **Week 9** | Computer Peripherals | Quiz 2 |
| **Week 10** | Modern Computer Systems | Homework 5 |
| **Week 11** | Networks and Data Communications |  |
| **Week 12** | - Ethernet and TCP/ IP Networking  - Communication Channel Technology | Homework 6 |
| **Week 13** | -Operating Systems: An Overview  -The User View of Operating Systems | Quiz 3 |
| **Week 14** | File Management and advanced processors | Homework 7 |
| **Week 15** | Final Exam |  |

1. **ACADEMIC INTEGRITY AND REGULATIONS**

* No late assignments will be accepted
* Participation and Assignment grade is based on effort to learn and understand

**Students with Disabilities**

In accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, including changes made by the Americans with Disabilities Amendments Act of 2008, the (INSERT DEPARTMENT NAME) department does not discriminate against qualified individuals with disabilities.

If you are a student with a documented disability/impairment (Psychological, Neurological, Chronic Medical, Learning Disability, Sensory, Physical) and require reasonable accommodations, please contact Student Support Services

Location: Pratt Building - 410

Contact Number: (718) 488-1044

Hours of operation: Monday – Thursday 9-7, & Friday 9-5.

Email address: studentsupportservices@brooklyn.liu.edu

Website: http://www.liu.edu/Brooklyn/SSS