



UNIVERSITY OF NEW YORK IN TIRANA
Course Syllabus

Course : Computer Organization and System Architecture (3 credit hours)
Lecturer : Vijayaraju.M
Office Hours : By Appointment.
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Catalog Description:

Comparative study of different hardware architectures, Computer Organization. i.e concerned with the structure and behavior of the various functional modules of the computer, and the development of the hardware for the computer taking into consideration a given set of specifications.

Course Purpose :

The purpose of this course is to study and understand the components of computing systems common to most Computer Architectures. In particular, this class is meant to Introduce Data Representation, Digital Logics, Instruction Sets (RISC, CISC), Vector Pipe lining, I/O organisation, Memory Organisation, etc.,

Prerequisite: Data Structures.

Required Readings

Computer System Architecture, 3rd Edition, by M. Morris Mano ISBN 0-13-175563-3.

Required Additional Materials

Students will be given handouts and extra notes as and when required.

Course Objectives

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

- Learn fundamental concepts of Computer Organisation
- Be able to design Digital Logic Circuits Using Gates and other simple Digital components.

- Learn concepts of Memory hierarchy, and basic characteristics of multi processors

Content of the Course

1. Introduction to Computer Organization & Architecture.

Types of Computers
Processors
Primary and Secondary Memory
I/O Devices.

2. Digital Logic Circuits and Components:

Digital Logic Circuits
Boolean Algebra-K.Map simplifications
Combinational Circuits
Sequential Circuits

3. Data Representation:

Data Types-Complements
Fixed, Floating point representation
Binary Codes-Error detection Codes

3. Central Processing Unit

Register Organization
Stack Organization, Instructions Formats,
Addressing, RISC
Overview of Pipeline and Vector Processing.

4. The Instruction Set Architecture Level

Data Types,
Instruction Formats
Addressing
Instruction Types
Overview of IA-64 Architecture and the Itanium 2.

5. Input-Output Organization

IO interface
Asynchronous Data Transfer
Modes of Transfer
Priority
Interrupt
Direct Memory Access
Input Output Processor.

6. Memory Organization

Main memory
Auxiliary Memory, Associative Memory, Cache

Memory- Virtual Memory, Example Operating Systems.

7. Parallel Computer Architectures

On chip parallelism

Coprocessors

Shared Memory Multiprocessors

Grid Computing

Course Requirements

Participation: Participation extends beyond mere attendance. Expect your instructor to keep track of how often you contribute to class discussion (as a whole), particularly during the panel discussion section. You may miss up to three classes without penalty - your first two absences count whether you have a good excuse or not. Each absence beyond the first three will cost you points off of your participation grade. The only exceptions to this rule are severe illness (doctor's note required) and UNYT approved trips/activities. Appropriate documentation for absences beyond the first three is necessary the class day directly before or after the one you miss. In general: this class is intensive and interactive. Missing class could seriously affect your grade! Students are reminded not to approach the instructor for copies of the previous week's materials during immediately before, during, or immediately after class. Students are expected to collect materials from their classmates or see the instructor during consultation hours.

Exams: Two examinations will be taken, a midterm and a final exam covering all course content during the final examination period. Test format may combine a mixture of short answer, true/false, matching, sort answer, and one or two essay questions covering *all* readings, lecture, hand-out and class discussion content.

Final Examination: TBA

General Requirements

Late assignments and absence from tests will not be tolerated. In the event of illness or emergency, contact your instructor **IN ADVANCE** to determine whether special arrangements are possible. The University's rules on academic dishonesty (e.g. cheating, plagiarism, submitting false information) will be strictly enforced. Please familiarize yourself with the **STUDENT HONOUR CODE**.

Criteria for Determination of Grade, including Evaluation Methods

Assignments(Seminars/Home works)	25%
Midterm	30%
Final	30%
Attendance/Lab	15%
Total	100%

Grading Scale

Letter Grade	Percent (%)	Generally Accepted Meaning
A	96-100	Outstanding work
A-	90-95	
B+	87-89	Good work, distinctly above average
B	83-86	
B-	80-82	
C+	77-79	Acceptable work
C	73-76	
C-	70-72	
D+	67-69	Work that is significantly below average
D	63-66	
D-	60-62	
F	0-59	Work that does not meet minimum standards for passing the course

Bibliography (Additional Readings)

- **Structured Computer Organization** Fifth Edition by Andrew S. Tanenbaum . ISBN 0-13-148521-0.
- **Logic and Computer Design Fundamentals** by M. Morris Mano and Charles R. Kime, International Edition, Pearson Edition, ISBN 0-13-191165-1.
- **Assembly Language and Computer Architecture using C++ and Java.** By Anthony J. Dos Reis. ISBN- 0-534-40527-4.
- **An Assembly Language Introduction to Computer Architecture** by Karen Miller, ISBN 0-19-512376-X

**Prepared by
Vijayaraju.M**