**University of Management and Technology**

**Course Outline**

**Course code :** EE 227 **Course title:** Computer Organization and Architecture

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| --- | --- |
| Program | BSEE |
| Credit Hours | 3 |
| Duration | One semester |
| Prerequisites | Digital Logic Design |
| Resource Person | Ahmed malik |
| Counseling Timing(Room# ) | See Office WindowOffice: 501  |
| Contact | ahmed.malik@umt.edu.pk |

**Chairman/Director signature………………………………….**

**Dean’s signature…………………………… Date………………………………………….**

**Learning Objective:**

* Program MIPS using assembly language
* Translate higher language code (C) to assembly and machine languages
* Understand CPU / ALU design and evaluate its performance under a given scenario
* Understand conventional single and multi-cycle data path
* Appreciate pros and cons of pipelined data path
* Comprehend virtual memory systems (storage disks, peripherals, etc)

**Learning Methodology:**

Lecture, interactive, participative

**Grade Evaluation Criteria**

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

**Marks Evaluation Marks in percentage**

Quizzes & Assignments 25

Mid Term 25

Final exam 50

Total 100

**Recommended Text Books:**

1. Computer Organization and Design (The Hardware / Software Interface), D.A. Patterson and J.L. Hennessy (5th Edition), 2013.

**Reference Book:**

1. Computer Architecture, 4th Edition: A Quantitative Approach D.A. Patterson and J.L. Hennessy,2007.

**Calendar of Course contents to be covered during semester**

**Course code: EE220 Course title: Computer Organization and Architecture**

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| --- | --- | --- |
|  **Week** |  **Course Contents**  | **Reference Chapter(s)** |
|  1 | Introduction Introduction to MIPS Processor Operations of the Computer Hardware Operands of the Computer Hardware Signed and Unsigned Numbers  | **Chapter 1:** Computer Abstractions And Technology **Chapter 2**:Language of the Computer |
| 2 | Representing Instructions in the Computer Logical Operations Instructions for Making Decisions  | **Chapter 2:**Language of the Computer |
| 3 | Supporting Procedures in Computer Hardware MIPS Addressing for 32-bit Immediates and Addresses  | **Chapter 2:**Language of the Computer |
| 4 | Technologies for Building Processors and Memory Performance | Chapter 1: Computer Abstractions And Technology  |
| 5 | Introduction Logic Design Conventions  | **Chapter 4:**The Processor |
|  6 | Building a Datapath  | **Chapter 4:**The Processor |
| 7 | Completion of Data path and Control A Simple Implementation Scheme  | **Chapter 4:**The Processor |
| 8 | **Mid Term Examination**  |  |
| 9 | An Overview of Pipelining Pipelined Datapath and Control  | **Chapter 4:**The Processor |
|  10 | Data Hazards: Forwarding versus Stalling Control Hazards Exceptions  | **Chapter 4:**The Processor |
|  11 | Introduction Addition and Subtraction Multiplication  | **Chapter 3:**Arithmetic for Computers |
|  12 | Division Floating Point  | **Chapter 3:**Arithmetic for Computers |
|   13 | Introduction Memory Technologies The Basics of Caches  | Chapter 5: Exploiting Memory Hierarchy  |
|  14 | Measuring and Improving Cache Performance  | Chapter 5: Exploiting Memory Hierarchy  |
|  15 | Virtual Memory (tentative)  | Chapter 5: Exploiting Memory Hierarchy  |