CMPE 310: Systems Design and Programming (Fall 2019)

Course Instructors:

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Text:

Barry B. Brey, "The Intel Microprocessors", 8th Edition, Pearson/Prentice Hall (2009).

Supplementary texts:

Muhammad Ali Mazidi and Janice Gillispie Mazidi, "The 80x86 IBM PC and Compatible Computers (Volumes I&II), Assembly Language, Design, and Interfacing", Third Edition, Prentice Hall (2000). John Uffenback, "The 80x86 Family, Design, Programming and Interfacing", Third Edition, Prentice Hall (2002).

Lab Supplementary Text:

Bob Neveln, "Linux Assembly Language Programming", Prentice Hall PTR (2000)

Course Description:

This course provides computer engineering students with system design software and hardware experience. This course covers hardware features that support advanced process and memory management in modern architectures such as the Pentium. The details of the entire chipset for 8086 are covered, including topics related to the register architecture, machine language, clock generator, bus controller and memory, I/O and interrupt interface. Other details of a complete computer system are discussed, including I/O bus protocols and support chips, memory chips, interrupt handler hardware and external support chips for disk storage, video and direct memory access. This course includes a laboratory that focuses on assembly language programming and board design software. There are two exams and labs will focus on assembly language programming and hardware projects.

Grading:

The distribution of weights for the exams, homeworks and projects is as follows:

Midterm	20%
Final	25%
Programming Projects/ Labs/ Homeworks	50%
Class Participation/ Quiz/ In-class exercise	5%

No in-completes will be given, except as required by university policy for truly exceptional circumstances. The final exam is cumulative. However, material covered after the second exam will be emphasized.

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NOTE: Cheating at any time in this course will cause you to fail the course.

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory [or for graduate courses, the Graduate School website].

The following is taken from the UMBC Student Handbook:

DEFINITIONS OF ACADEMIC MISCONDUCT

Academic misconduct may include but is not limited to the following:

> Cheating: knowingly using or attempting to use unauthorized material, information, or study aids in any academic exercise.
>
> Fabrication: Intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
>
> Facilitating Academic Dishonesty: Intentionally or knowingly helping or attempting to help another commit an act of academic dishonesty.
>
> Plagiarism: Knowingly representing the words or ideas of another as one's own in any academic exercise, including works of art and computer-generated information/images.

POLICY FOR RESOLVING CASES OF ACADEMIC MISCONDUCT

Individual faculty members have the right and responsibility to deal directly with any cases of academic misconduct which arise in their courses. Instances of academic misconduct may be identified in one of two ways. If a faculty member believes a student has committed an act of academic misconduct--for example, by direct observation of student behavior, by comparing the contents of an assignment with that submitted by another student, or by reviewing notated sources or references--the faculty member, in consultation with the Chair of the Academic Conduct Committee, will assess the student's alleged misconduct and the faculty member's options. If a student believes that academic misconduct has occurred, the student will notify either the faculty member or the Chair of the Academic Conduct Committee.

It is particularly important that the Chair of the Academic Conduct Committee be consulted. The Chair can provide knowledge and insight for the faculty member. Communication of instances of academic misconduct also protects the integrity of the university by providing a means of recording infractions that may be repeated by a particular student, or which may prove endemic to a particular course or department. Consultation with the Chair of the Academic Conduct Committee provides a formal record of the infraction and resolution, protecting the student, professor, and university should any questions later arise. The student will have the opportunity to respond to an accusation of academic misconduct.

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Tentative Course Outline

Date	Topic
Week 1	Introduction
Week 2	Intel Microprocessor History and Architecture Basics
Week 2	Intel Register Architecture: Basics
Week 3	8086/8088 Hardware Specs
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Week 4	Bus Timing
Week 4	Memory Interface
Week 5	Memory Interface
Week 5	Memory Interface
Week 6	Memory Interface
Week 6	Memory Interface
Week 7	Review
Week 7	Midterm Exam
Week 8	Basic I/O
Week 8	Basic I/O
Week 9	Basic I/O
Week 9	Interrupts
Week 10	Interrupts
Week 10	Direct Memory Access
Week 11	Direct Memory Access
Week 11	Disk Storage and Video
Week 12	Disk Storage and Video
Week 12	Bus Interface
Week 13	Bus Interface
Week 13	OS Fundamentals, Segmentation and Paging
Week 14	OS Fundamentals, Segmentation and Paging
Week 14	Protected Mode Addressing
Week 15	Paging
Week 15	Advanced Topics
Finals	Final Exam Week

Note: Changes/Additions to this schedule will be posted on my website
https://swe.umbc.edu/~deepakk1/cmpe310/