EE2004 Microcomputer Systems

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Course materials in Canvas

Learnt topics

EE1001 Foundations of Digital Techniques
number systems, Boolean algebra
EE2000 Logic Circuit Design
decoder & encoder, register & counter
CS2311 Computer programming
algorithm, programming techniques, data types

Aims

* introduce basic structure of modern computer systems
  (processor, memory, I/O, system bus, instruction set)
* learn programming computer
  (assembly language)

Intended Learning Outcomes (ILOs)

1. describe the structure and major components of microcomputer

2. explain the idea of memory hierarchy, the use of cache and virtual memory

3. describe the communication between processor and peripheral devices

4. apply assembly language programming to solve problems

Syllabus:

1 Introduction to computer

- history
- review number systems, logic circuits
- basic structure of computer
- computer operation

2 PIC

- architecture
- microprocessor, microcontroller, embedded system
- PIC18

3 Assembly language programming

- branch, loop, time delay
- I/O port
- arithmetic and logic instructions
- addressing modes
- look-up table, stack, subroutine

4 Input/Output (I/O)

- peripheral
- programmed I/O, interrupt
- timer

5 Serial communication

- serial port
- USART

References:

C. Hamacher, Z. Vranesic, S. Zaky, Computer Organization, McGraw-Hill, 2002.

Han-Way Huang
PIC Microcontroller: An introduction to software and hardware interfacing, Thomson/Delmar Learning, 2005.

S. Katzen
The Essential PIC18® Microcontroller, Springer, 2010.

M. A. Mazidi, R. D. McKinlay, D. Causey
PIC microcontroller and embedded systems : using Assembly and C for PIC18, Pearson/Prentice Hall, 2008.

Assessment:

Continuous Assessment: 50%

(**must obtain at least 30% of total continuous assessment mark, 75% tutorial attendance**)

Examination: 50%

(2-hour, **must obtain at least 30% of total examination mark**)

All assessments are open-book

Continuous Assessment:

Tutorial in-class exercises:

Weeks 1-11 – 10%

Mini-project (proposal, demo, report):

Weeks 12-13 – 10%

Quiz :

Week 6 – 10%

Formal Test :

Week 13 – 20%