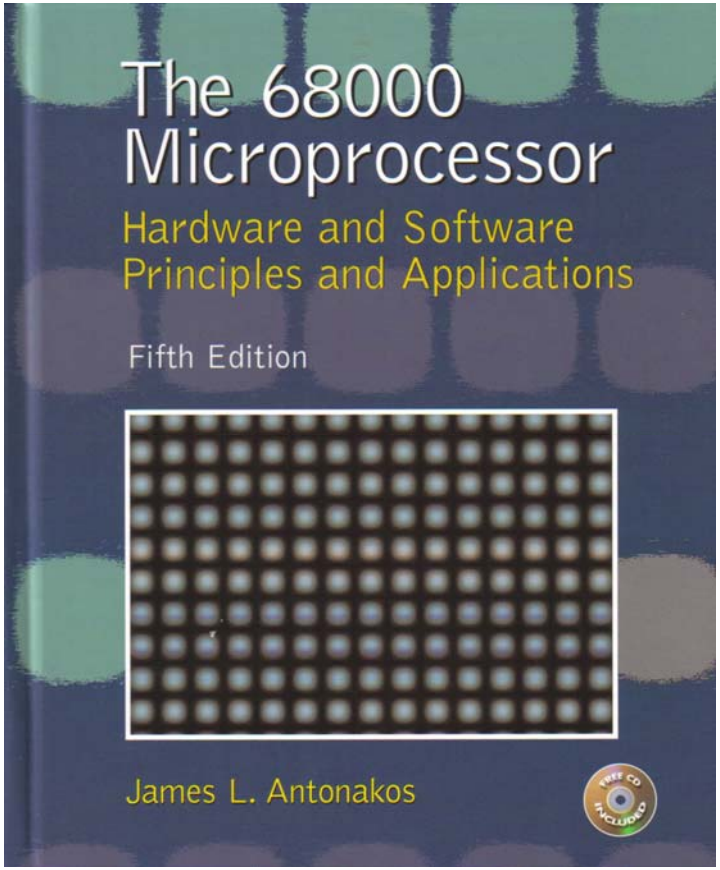
# EECE416 :Microcomputer Fundamentals and Design ("Microcomputer & Microprocessor")

## Instructor: Dr. Charles Kim





Source: www.mwftr.com

# Class Web-Site

- CLASS NOTES and THE OTHER SIDE-A (Q&A) and THE OTHER SIDE-B of the CLASSNOTES - Circuit Theory, Microcomputer, PIC16F877, Embedded Computing, and Electrical Engineering Lab.
- Embedded Computing with PIC 16F877-Assembly Language Approach:*A complete guided project book for PIC students* - Topics covered, with full assembly source codes, are: **Bootloader**, Hex code download, LED light on/off, Piezo-electric buzzer application, **LCD** and series LCD connection, AT **Keyboar**

- **Contents: Syllabus, Presentation Files, Software, Etc**
- **Note that class notes in the web-page may not be the same as the one I use in the class. In other words, web-page is not always timely updated.**

# Learning Outcomes

- **(c) An ability to design a system component, or process to meet desired needs**
  - Programming of assigned works
- **(e) An ability to identify, formulate, and solve engineering problems**
  - Programming of class projects
- **(g) An ability to communicate effectively**
  - Writing Class Project Reports
  - Presentation of Class Projects
- **(h) A knowledge of contemporary issues**
  - Assignment on emerging technologies and their socio-cultural impact
    - Go-green
    - Sustainability
    - E-waste
    - Robots
- **(i) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice**
  - Familiarity in assembly language coding environment

# Course Objectives

- Familiarity in Computer Architecture
- Architecture of Motorola 68000 Microprocessor
- Assembly Language Programming in 68000
- Architecture of PIC 16F877 microcontroller
- Assembly Language Programming in PIC 16F877
- Application of 16F877 for project

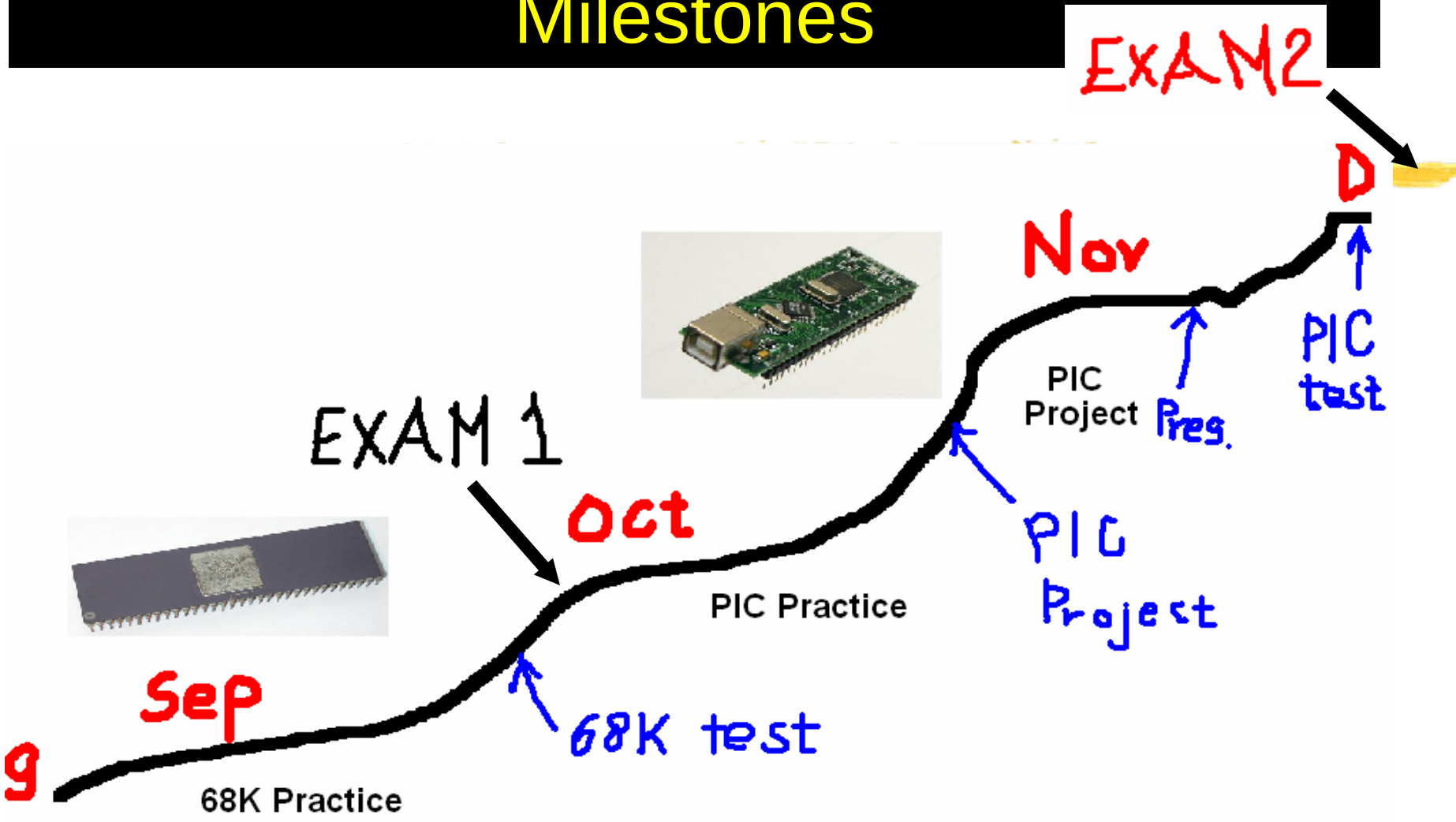
# Course Structure

- Computer Architecture-Brief
  - Computer History
  - Computer Architecture-brief
- 68000 Processor (40%)
  - Architectural Study
  - Instruction Sets
  - ASM68K & EMU68K (DOS-based assembler and emulator)
  - EASY68K (Windows-based assembler/simulator)
  - Programming Practices
- 16F877 microcontroller (60%)
  - Architectural study
  - Instruction Sets and MPLAB( Windows-based assembler & simulator)
  - Programming Practices
  - Projects

# Course Expectations

- Lecture/Programming Lab Combination
- Active Participation in Class Coding Practices
- Timely Submission of Program Practices
- Could be an Early Start of Senior Design Project Implementation
  - PIC Board Purchase encouraged, but not a must
- Individual Work –PC/Laptop/Tablet use in Classroom encouraged.
- Greater Efforts in Project

# Milestones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68K Practice

# Grading

- Motorola 68000 Programming (40%)
  - Practice Coding
  - Homework
  - Exam
- PIC 16F877 Programming (50%)
  - Practice Coding
  - Homework
  - Exam
  - Class Project
- uP Related Assignment (5%)
  - Contemporary Issues – emerging technology and its impact
- Others (5%)
  - Attendance – on-time arrival only

# Advice for success in the class

- Be on time – Important things are covered at the very first moment and at the very first few classes.
- Finish work in the class – Do not postpone or extend the work to the evening/night hours.
- Bring your own Laptop – It would be more convenient and productive than using a PC in the class.
- Do your first coding work yourself and master it – all other coding practices will be built on the first work.
- Classroom
  - LKD3121
- Office Hour
  - TR 3:00 – 4:30pm , F 1:30 – 3:00pm (appt only)