www.mwftr.com/416F15.html

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

Fall 2015

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Department of Electrical and Computer Engineering

Howard University

Course Introduction

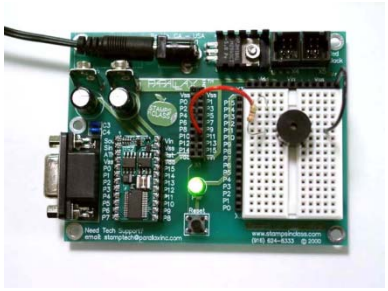
- **EECE416: Microcomputer Fundamentals**
  - TR 1710-1830 @LKD3121
  - Dr. Charles Kim (LKD 3014) 202-806-4821; ckim@howard.edu
  - Office Hours: T-R-F 2 – 4pm
  - TA and Assistant: ??
- **Course Focus**
  - Theme- Intel x86-based curriculum
  - Secondary - Introduction of small microcontrollers that can find many applications, such as Basic Stamp, PIC, Arduino, and Raspberry Pi, etc
  - **Emphasis 1:**
    - IA 32 and x86 Architecture as background information – MASM (Microsoft Macro Assembler) 32 Assembly language
  - **Emphasis 2:**
    - Microcontrollers and their applications
    - Embedded SW Development and Debug Tools (Application Environments)

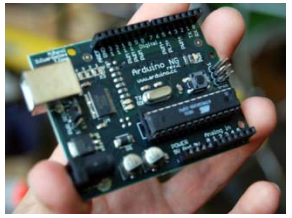
Learning Outcomes - ABET

- **(c) An ability to design a system component, or process to meet desired needs**
  - Programming of assigned works
  - Programming of class projects
- **(j) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice**
  - Familiarity in assembly language coding environment
  - Microcontroller Programming Development Tools
- **(k) A knowledge of contemporary issues**
  - Assignment on emerging technologies and their socio-cultural impact
    - Go-green
    - Sustainability
    - E-waste
    - Robots
  - Patent Disputes surrounding smartphones between Apple and Samsung
  - Next Gen Smartphones → new direction?

Course Structure and Focuses

- Computer Architecture in General
  - Computer History
  - Computer Architecture-brief (ISA)
- IA32 and MASM (Microsoft Assembler)
  - Architectural Study
  - Instruction Sets
  - MASM32 and Code Viewer
  - Programming Practices& **coding Project**
- Microcontrollers
  - **Arduino**
  - **Basic Stamp**
  - Raspberry Pi
  - **Project**

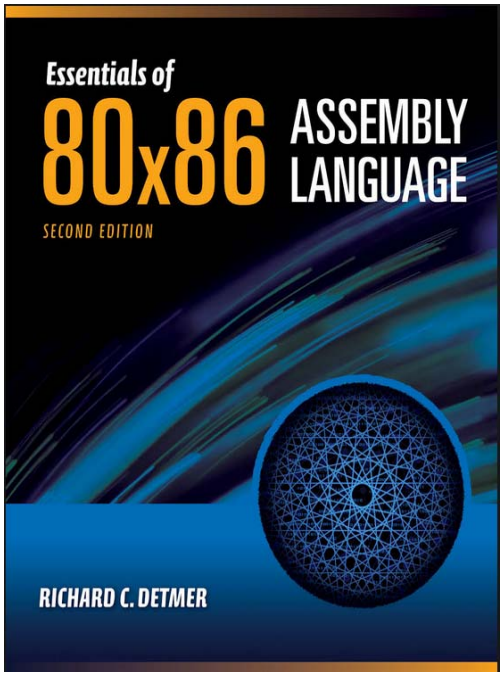


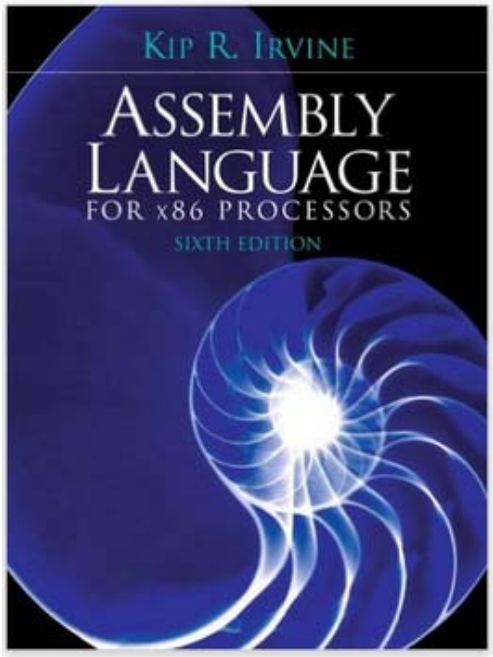


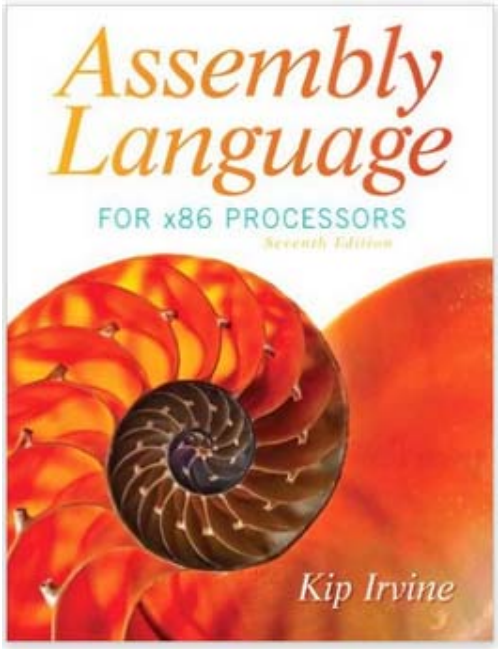
- Class Web Page: www.MWFTR.com

Textbooks

- Essentials of 80x86 Assembly Language
  - Richard Detmer, 2nd Ed
- Assembly Language for x86 Processors
  - Kip Irvine (6th or 7th Ed)
- Resources
  - Art of Assembly Language Programming
    - Randall Hyde
    - http://www.arl.wustl.edu/~lockwood/class/cs306/books/artofasm/toc.html
    - Chapter 3 –>







Course Expectations

- Lecture + Programming Lab Combination
- Active Participation in Lecture and Lab
- Timely Submission of Program Practices
- Individual/Group Works –PC/Laptop use in Classroom is highly recommended (especially in the LAB)
- An Early and Essential Element for Senior Design Project Implementation & a must for Embedded-Computing Class (Spring 2016)

Grading

- Quizzes - 20%
- Final Exam – 20%
- Assignments (Coding etc.) – 30%
- Projects – 20%
- Other Assignment – 10%
  - Essay Writing on Contemporary Issues (emerging technology in computer and embedded systems) – 5%
  - Attendance – 5% (On-time arrival only)
- Grades:
  - A: 90% or above
  - B: 80 – 89 %
  - C: 70 - 79 %
  - D: 60 – 69 %
  - F: 59% or below

Class Schedule (Tentative)

- August:
  - Week 4 – Class Introduction and Computer History
- September:
  - Week 1 – Computer Architecture
  - Weeks 2 – 4: IA32 & MASM32 & Coding practice
- October
  - Week 1: Instructions and Coding continue
  - Weeks 2- 4:Microcontrollers {Basic Stamp2 and Arduino (and Raspberry Pi) }
- November
  - Week 1: Microcontroller Project and Presentation
  - Weeks 2-4: Advanced subjects of IA and MASM
- December
  - Week 1: Final Exam

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. (80/20 rule)
- 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.
- Office Hour
  - Open Door Policy (except 1200 – 1300 lunch hour)
  - By appointment (or just walk-in)