

EECE416 :Microcomputer Fundamentals and Design (“Microcomputer & Microprocessor”)

Fall 2016

Dr. Charles Kim

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-W-R 1 – 3 pm
 - 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
- ☒ Endian Neutrality
- ☒ Next Gen Smartphones → new direction?



Course Structure and Focuses

⌘ Computer Architecture in General

- ☒ Computer History
- ☒ Computer Architecture-brief (ISA)



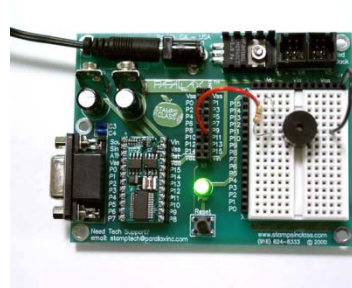
⌘ IA32 and MASM (Microsoft Assembler)

- ☒ Architectural Study
- ☒ Instruction Sets
- ☒ MASM32 and Code Viewer
- ☒ Programming Practices & **coding Project**



⌘ Microcontrollers

- ☒ **Arduino**
- ☒ **Basic Stamp**
- ☒ Raspberry Pi
- ☒ **Project**



Textbooks

⌘ Essentials of 80x86 Assembly Language

⌘ Richard Detmer, 2nd Ed

⌘ Assembly Language for x86 Processors

☒ Kip Irvine (6th or 7th Ed)

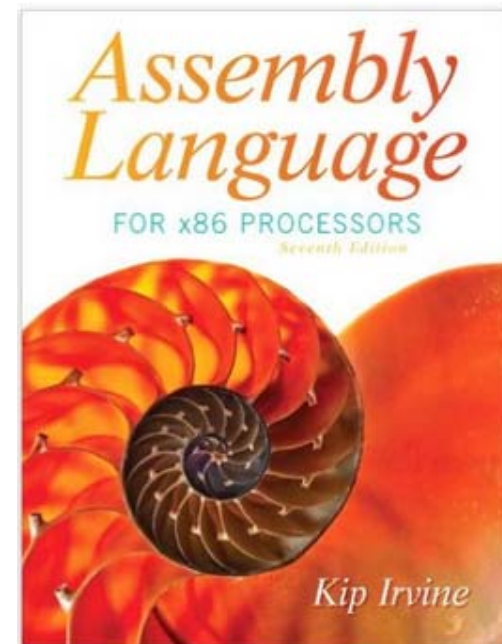
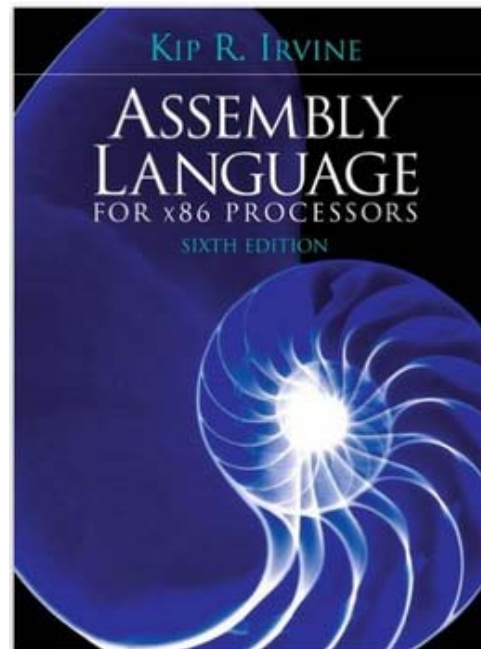
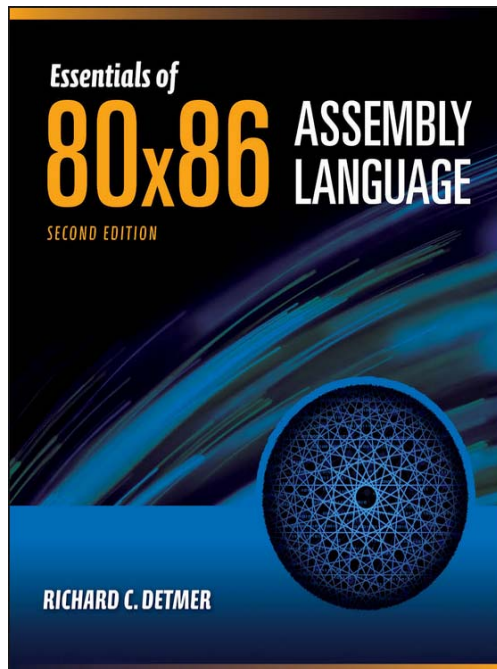
⌘ Resources

☒ Art of Assembly Language Programming

☒ Randall Hyde

☒ <http://www.arl.wustl.edu/~lockwood/class/cs306/books/artofasm/toc.html>

☒ Chapter 3 →



Class Website



The screenshot shows a web browser window with the address bar containing `www.mwftr.com/416F16.html`. The page content includes the URL `www.mwftr.com/416F16.html`, a logo for MWFTR (Microcomputers, Windows, and File Transfer) featuring a grid of red dots with green lines forming the letters, and the course title **EECE416 Microcomputers**. Below the title, the department and university information are listed: Department of Electrical and Computer Engineering, Howard University, Washington, DC 20059. The instructor is identified as **Instructor: Dr. Charles Kim**. A list of subjects is provided, including a link to the syllabus in PDF format.

`www.mwftr.com/416F16.html`



EECE416 Microcomputers

Department of Electrical and Computer Engineering
Howard University
Washington, DC 20059

Instructor: Dr. Charles Kim

[Syllabus](#) (in [pdf format](#)) of the course

Subject 1: Introduction

Subject 2: Computer History

Subject 3: Computer Architecture and [Intel i386 Datasheet](#))

Subject 4: x86 Assembly Programming

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 - revisited

- ⌘ Quizzes - 30%
- ⌘ Final Exam – 20%
- ⌘ Assignments (Coding etc.) – 20%
- ⌘ Projects – 20%
- ⌘ Other Assignment – 10%
 - ⌘ Essay Writing on Contemporary Issues (emerging technology in computer and embedded systems) – 5%
- ⌘ Attendance – Extra 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:

- ☒ Class Introduction and Computer History

⌘ September:

- ☒ Computer Architecture
- ☒ IA32 & MASM32 & Coding practice
- ☒ Quiz 1 (T 9/27)

⌘ October

- ☒ Instructions and Coding continue
- ☒ Microcontrollers
- ☒ Quiz 2 (T 10/27)

⌘ November

- ☒ 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)