

DRAFT SYLLABUS FOR ECE 3130 - MICROCOMPUTER SYSTEMS

Required Course for BSEE and BSCmpE

Catalog Description:

Lec. 3, Lab. 3, Credit 4.

Prerequisite : ECE 2110 and CSC 2100

Microcomputer system architecture. Software/hardware analysis. Programming microcomputer systems using Assembly and C languages. Design hardware subsystem and integration with microcontroller for engineering applications.

Math & Basic Sciences: 0 credits

Engineering Topics: 4 credits

Contains significant design

General Education: 0 credits

Other: 0 credits Specify

Course Coordinator: Dr. Mohamed Mahmoud

Updated: 3/19/2015

Text Book(s) and Supplemental Material(s):

Huang, Han-Way, The HCS12/9S12: An Introduction to Software and Hardware Interfacing, Second Edition, Delmar Cengage Learning, 2010

Course Goal(s):

To make students proficient in: the general concepts and terminology in computer architecture, the internal organization of a typical microprocessor, the process of developing/analyzing microprocessor-based software, the architecture of a typical microcomputer board, the instruction set of a microprocessor, and designing hardware subsystems and interfacing them to a microcomputer system.

Instructional Outcomes for the Course:

Upon completion of this course, the student will be able to:

1. Learn the general concepts and terminology in computer architecture.
2. Draw a block diagram of a typical microcomputer and describe the relationships among its various components.
3. Describe the programmer's model, the memory organization, the various addressing modes, and the hardware components of a microprocessor.
4. Analyze and design software in assembly and C languages for microcomputer systems.
5. Analyze and design hardware subsystems and interface them to microcomputer systems.
6. Describe and draw block diagrams of the various types of input/output interfaces to a microprocessor.
7. Design interrupt service routines in Assembly and C languages.
8. Analyze and program timer functions.
9. Write a technical report.
10. Design hardware subsystems and interfacing them to a microcomputer system.

Criterion 3 Student Outcomes addressed by this Course:

- 3a. an ability to apply knowledge of mathematics, science, and engineering.
- 3b. an ability to design and conduct experiments, as well as to analyze and interpret data.

3c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

3e. an ability to identify, formulate, and solve engineering problems.

3g. an ability to communicate effectively in both written and oral forms.

3k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Criteria addressed by this Course:

... engineering topics necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

... discrete mathematics.

Course Topics:

1. Microcomputer system architecture (10%)

2. Analyze and design software components in Assembly and C languages for microcomputer system (21%)

3. Interfacing to a microprocessor (16%)

4. Interrupts and Resets (16%)

5. Timer functions (16%)

6. Analyze and design hardware sub-systems and interface them to a microcomputer system (21%)

Additional Topics/Assignments for dual-level (4000/5000) courses:

N/A