

UNIVERSITY OF JORDAN
COLLEGE OF ENGINEERING
DEPARTMENT OF COMPUTER ENGINEERING

COURSE OUTLINE

ABET Unit Classification:	Engineering
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Compliant Catalogue:	2007/02
Course Code:	0907333
Course Title:	Embedded Systems
Credit Hours:	3

Class Schedule:	Sun, Tue, and Thu: Three 50-minute sessions Mon and Wed: Two 75-minute sessions
Laboratory Schedule:	None
Tutorial Schedule:	None
Duration:	Fifteen (15) weeks

Course Coordinator:	Dr. Gheith Abandah
Prepared by:	Course Instructors
Date of Outline Preparation:	Jan 23, 2009
Date of Last Revision:	Jan 30, 2009
Checked by:	Course Instructors
Approved by HoD:	Dr. Gheith Abandah

University of Jordan
Computer Engineering Department
Course Outline
Embedded Systems (0907333)

I. Course Description

The main objectives of this course are: learning and understanding basics of embedded systems, microcontrollers' architectures, programming microcontrollers, designing simple embedded systems, and linking various concepts of electronics and circuits within the embedded systems framework.

II. Course Objectives

By the end of this course, you should be familiar with the microcontrollers and embedded systems basic architectures, features, and programming.

III. Expected Outcomes

1. Ability to design and construct complete simple embedded system hardware.
2. Ability to program and interface embedded systems for industrial applications.

IV. Textbooks and References

1. Tim Wilmshurst, *Designing Embedded Systems with PIC Microcontrollers: Principles and Applications*, Newnes, 2007. **Main Textbook.**
2. Tim Wilmshurst, *An Introduction to the Design of Small-Scale Embedded Systems*, Palgrave, 2001.

V. Student Materials

Textbook, Class Handouts, Engineering Calculator, PC, and the Internet.

VI. College Facilities

A classroom with whiteboard and projection facilities, library, and computer laboratory.

VII. Instructional Methods

1. Lectures
2. Office Discussions
3. Tutorials

VIII. Evaluation of Outcomes

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| 1. Home works and Quizzes | 20% |
| • Three home works; 3 marks for each homework | |
| • Two quizzes; 6 marks for the 1 st quiz and 5 marks for the 2 nd | |
| 2. Midterm Exam | 30% |
| 3. Final Exam | 50% |

IX. Class Policies

- Attendance is required
- Home works are due on quiz or midterm exam dates
- All submitted work must be yours
- Cheating will not be tolerated

X. Professional Component Contribution

This is an introductory course in embedded systems hardware design, programming, and interfacing techniques. It helps students to understand how various hardware components of a modern microcontroller can interface within real systems.

XI. Course Outline

The following table is a tentative calendar of this course. An updated calendar will be posted on the web.

Starting Date	Topic	Textbook Sections
8/2	Getting Started with Embedded Systems	1.1–1.6
15/2	Minimum Systems and the PIC® 16F84A	2.1–2.6
22/2	Starting to Program – An Introduction to the Assembler	4.1–4.4
1/3	Homework 1 Announcement	TBA
1/3	Building Assembler Programs	5.1–5.4
8/3	Quiz 1 and Homework 1 Due	TBA
8/3	Working with Time: Interrupts, Counters, and Timers	6.1–6.5
15/3	Parallel Ports, Power Supply and the Clock Oscillator	3.1–3.6
22/3	Homework 2 Announcement	TBA
29/3	Midterm Exam (5:00–6:30 pm) and Homework 2 Due	TBA
29/3	Starting with Serial	10.1, 10.2, 10.10.1-10.10.6
12/4	Data Acquisition and Manipulation	11.1–11.3
19/4	Homework 3 Announcement	TBA
19/4	The human and physical interfaces	8.1–8.9
26/4	Quiz 2 and Homework 3 Due	TBA
3/5	Taking Timing Further	9.1–9.8
17/5	C Programming	
28/5	Final Exam (10:00–12:00)	TBA

XII. Sections and Instructors

Sec	Meeting Time	Room	Instructor	Office Hours	e-mail, Homepage
1	S, Tu, Th 13-14	CPE 001	Prof. Majid Al-Tae	TBA	altaeem@ju.edu.jo http://fetweb.ju.edu.jo/staff/cpe/altaeem
2	S, Tu, Th 14-15	CE 002	Eng. Musa AL-Yaman	TBA	m.alyaman@ju.edu.jo http://fetweb.ju.edu.jo/staff/cpe/malyaman/EmbeddedSystems.html
5	M, W 8:00-9:30	CPE 001	Dr. Gheith Abandah	S 9-10, M 2-3, Tu 9-10	abandah@ju.edu.jo , http://www.abandah.com/gheith