Syllabus for
CMPE 441—Microprocessor Systems Design
3 Credit Hours
Fall 2012

I. COURSE DESCRIPTION

Introduction to Intel-8085 and ARM microprocessors, their architecture, instructions, and assembly-level language programming techniques. Interface Intel-8085 with peripheral devices, study, and use of Intel-8085 (ARM) cross-assembler and simulator. Incorporate lab experience in the course.
Prerequisites: CMPE 340 Lecture and Lab.
Course fee: $55

II. COURSE GOALS

The purpose of this course is to enable the student to apply the principles of microprocessor system design to applications involving computing and controls.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

As a result of successfully completing this course, the student will be able to do the following:

A. Explain the architecture of Intel-8085 and ARM 7/9.

B. Write assembly level programs for Intel-8085 and ARM 7/9.

C. Demonstrate the ability to hand-assemble, link, and load programs.

D. Explain the various peripheral interface circuits that are necessary for the operation of Intel-8085.

E. Design simple interfaces to Intel-8085 or ARM 9.

F. Use the assembler and simulator to design systems.

IV. TEXTBOOK AND OTHER LEARNING RESOURCES

A. Required Materials
1. Textbooks
Goanker, Ramesh S. *Microprocessor Architecture ETC (W/CD).* 5th ed.
Upper Saddle River, NJ: Prentice-Hall, 2002. ISBN-13: 9780130195708
2. Other
None

B. Optional Materials
1. Textbooks
Furber, Steve. *ARM System-on-Chip Architecture.* 2nd ed. Upper Saddle River, NJ: Prentice-Hall, 2000. ISBN-13: 978-0201675191
2. Other
None

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
2. Students taking a late exam because of an unauthorized absence are charged a late exam fee.
3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, electronic, video, multimedia, or computer software. Plagiarism and other forms of cheating involve both lying and stealing and are violations of ORU's Honor Code: "I will not cheat or plagiarize; I will do my own academic work and will not inappropriately collaborate with other students on assignments." Plagiarism is usually defined as copying someone else's ideas, words, or sentence structure and submitting them as one's own. Other forms of academic dishonesty include (but are not limited to) the following:
   a. Submitting another's work as one's own or colluding with someone else and submitting that work as though it were his or hers;
   b. Failing to meet group assignment or project requirements while claiming to have done so;
   c. Failing to cite sources used in a paper;
   d. Creating results for experiments, observations, interviews, or projects that were not done;
   e. Receiving or giving unauthorized help on assignments.

   By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means. Penalties for any of the above infractions may result in disciplinary action including failing the assignment or failing the course or expulsion from the University, as determined by department and University guidelines.
4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
5. Students are to be in compliance with University, school, and departmental policies regarding Whole Person Assessment (WPA) requirements. Students should consult the WPA handbooks for requirements regarding general education and the students' majors.
   a. The penalty for not submitting electronically or for incorrectly submitting an artifact is a zero for that assignment.
   b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.

B. Course Policies and Procedures

1. Evaluation Procedures

Homework Assignments	30%
Mid Exam	30%
Final Exams	40%
Total	100%

2. Whole Person Assessment Requirements

   The final grade will be reduced by 5% for any WPA artifacts that are not submitted by the end of the semester (not 5% per artifact but 5% total).

3. Other Policies and/or Procedures

a. Handouts, verbal instructions, homework assignments, and laboratory demonstrations cannot be scheduled in advance and will occur when appropriate for the subject being discussed. If a student misses a class, the information must be obtained from a student who did attend class. The instructor will neither loan his notes nor give a private repeat of the lecture.

b. The primary way to acquire a working knowledge of the material in this course is to do numerous homework problems. For that reason, several problems will be assigned each week. Solutions will be published, usually on the same day that the assignment is due. In order to encourage students to work problems on a strict schedule, homework will count on the final grade. All assignments are due at the beginning of class. No late assignments will be accepted. Assignments from those who are absent will not be accepted. Following is the procedure for homework:

Given:	Show appropriate diagrams and necessary information.
Problem:	State what is to be determined.
Solution:	Show how the solution is obtained. Explain your work and all the symbols used. Work should be neat. On all homework circle each answer.

c. Working with other students in solving homework problems is not considered dishonest, but students should take care not to become dependent upon someone else. It is much better to plan and execute the solution to problems on one's own. Copying solutions to homework problems from classmates is not right. Copying from someone else or otherwise violating the conditions of the exam/assignment is dishonest. Dishonesty in an exam/assignment, if detected, will lead immediately to a failing grade for the course and a report to the Dean of Arts and Sciences.

VI. COURSE CALENDAR

Week	Topic
1	Introduction
2-3	Microprocessor Architecture and Operation
4	Instruction Set
5	Data Transfers, Logic Operations, and Branching
6	Program Assembly and Testing
7	Examination 1
8	The Stack and Subroutine
9	Arithmetic Operations
10-11	Program Controlled I/O
12	Digital Data Entry and Display
13	Interrupts and DMA
14	Examination 2
15	Analog Data Input and Output
16	PIC Microcontrollers
17	Final Examination

Course Inventory for ORU's Student Learning Outcomes
CMPE 441—Microprocessor System Design
Fall 2012

This course contributes to the ORU student learning outcomes as indicated below:
Significant Contribution – Addresses the outcome directly and includes targeted assessment.
Moderate Contribution – Addresses the outcome directly or indirectly and includes some assessment.
Minimal Contribution – Addresses the outcome indirectly and includes little or no assessment.
No Contribution – Does not address the outcome.

The Student Learning Glossary at http://ir.oru.edu/doc/glossary.pdf defines each outcome and each of the proficiencies/capacities.

OUTCOMES & Proficiencies/Capacities	Significant Contribution	Moderate Contribution	Minimal Contribution	No Contribution
1	**Outcome #1 – Spiritually Alive** Proficiencies/Capacities				
1A	Biblical knowledge				X
1B	Sensitivity to the Holy Spirit				X
1C	Evangelistic capability				X
1D	Ethical behavior			X	
2	**Outcome #2 – Intellectually Alert** Proficiencies/Capacities				
2A	Critical thinking	X			
2B	Information literacy	X			
2C	Global & historical perspectives			X	
2D	Aesthetic appreciation				X
2E	Intellectual creativity	X			
3	**Outcome #3 – Physically Disciplined** Proficiencies/Capacities				
3A	Healthy lifestyle				X
3B	Physically disciplined lifestyle				X
4	**Outcome #4 – Socially Adept** Proficiencies/Capacities				
4A	Communication skills			X	
4B	Interpersonal skills			X	
4C	Appreciation of cultural & linguistic differences			X	
4D	Responsible citizenship			X	
4E	Leadership capacity			X	