EE 3752 — Microprocessor Systems

Fall 2017

Lecture time: 7:30-8:20 MW
Lab time: 2 hours on Tu or Th

Text: W. Hohl and C. Hinds (2015), *ARM Assembly Language: Fundamentals and Techniques* (2nd ed.), CRC Press.

Instructor: Jerry Trahan
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Course web page: on Moodle

Office Hours: 8:30-10:30 MW
2:00-3:00 F
or by appointment

Description: Theory and design of microprocessors; semiconductor technologies, architectures, assembly language, software development, input/output design, applications, and interfacing.

Prerequisites: CSC 1253 and EE 2740

Goals/Instructional Objectives:

This course aims to provide the student with a basic knowledge of microprocessor design. The course is to educate the student to be able to: 1. understand and be capable of designing low level assembly language programs for a microprocessor; 2. understand and be capable of designing a basic computer system including a microprocessor. The course also aims to provide a basic understanding of the operation of a microprocessor and assembly language so that the student is prepared for advanced courses in computer hardware and/or software.

Project: The project will be created by each student group and include a lab report. The scope and size of the project is expected to be at least 2-3 lab experiments. Sample project topics will be given later in the semester; however, each group must create a project of their own topic and design. As with lab experiments, code must be submitted along with the project report. Each group will be expected to conduct a short demonstration (10-15 minutes) of their project.

Grading:

Participation exercises	10%
Lab experiments and reports	30%
Project	15%
2 Tests	25%
Final	20%

Overall scores will be scaled, typically by scaling the highest score up to 100.

There will be one optional make-up lab session at the end of the semester to give each group the opportunity to make up a single missed experiment for partial credit (max score 80%).

A+	97 and higher
A	93 - 96.99
A-	90 - 92.99
B+	87 - 89.99
B	83 - 86.99
B-	80 - 82.99
C+	77 - 79.99
C	73 - 76.99
C-	70 - 72.99
D+	67 - 69.99
D	63 - 66.99
D-	60 - 62.99
F	below 60

Policy on Exams and Lab Reports:

1. Each lab report is due via electronic submission, in .pdf, .doc, or .docx format, on Moodle by 11:55 PM on the date indicated on the assignment, along with any applicable code asked for in the lab directions. Reports submitted after that time will not be graded and will automatically receive a 0. Although only one submission is required per group, the names of all members should be included on the report and in the code documentation for those members to receive proper credit. A student whose name is not on both the report and the accompanying code with documentation cannot receive credit for either.
2. Make-up work will be allowed only under extenuating circumstances. (An exception is a make-up lab experiment that is allowed during the designated make-up week.)
3. You may discuss experiment questions and their solution approaches with other students, but I expect you to write up your own solutions and code.
4. Tests will be closed book and open notes.

Academic Integrity: The following is paraphrased from the LSU Student Advocacy and Accountability web site.

{ http://www.lsu.edu/students/saa/faculty-staff/academicintegrity/syllabusstatements.php }

The LSU Commitment to Community charges students to maintain high standards of academic and personal integrity. All students are expected to read and be familiar with the LSU Code of Student Conduct and Commitment to Community. Students who are suspected of violating the Code of Conduct will be referred to the office of Student Advocacy & Accountability. For undergraduate students, a first academic violation could result in a zero grade on the assignment or failing the class and disciplinary probation until graduation.

Accommodations for Persons with Disabilities:

The University is committed to making reasonable efforts to assist individuals with disabilities in their efforts to avail themselves of services and programs offered by the University. To this end, Louisiana State University will provide reasonable accommodations

for persons with documented qualifying disabilities. If you have a disability and feel you need accommodations in this course, you must present a letter to me from Disability Services in 115 Johnston Hall, indicating the existence of a disability and the suggested accommodations.

Important Dates: Expected dates for tests:
Test 1 — Wed., October 11
Test 2 — Mon., November 13
Final exam —Sat., Dec. 9, 10:00 am - noon (LSU final exam schedule)

Relationship of Course to Program Outcomes:

The course contributes to these outcomes:	How?
1. an ability to apply knowledge of mathematics, science, and engineering	Students apply digital logic and high-level computer language knowledge at the meeting point of microprocessor systems and assembly language.
2. an ability to design and conduct experiments, as well as analyze and interpret data	Students perform experiments to create assembly language programs utilizing a compatible computer.
3. 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	The course will instruct students in how to design assembly language programs for a microprocessor and design a basic computer system including a microprocessor.
5. an ability to identify, formulate, and solve engineering problems	Developing assembly language software for a computer system requires solving hardware and software engineering problems.
7. an ability to communicate effectively	Design choices and procedures used in the design of experiments must be conveyed in written form.
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	Students use several different tools and techniques in order to debug their programs.
12. an ability to apply knowledge of probability and statistics, including applications appropriate to the program; mathematics through differential and integral calculus; sciences (defined as biological, chemical, or physical science); and engineering topics (including computing science) necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components	To design a basic computer system including a microprocessor, to develop efficient assembly language software for such a system, and to perform experiments, students must solve hardware and software engineering design problems.