Course number and name:
EEEN 4344 – Computer Architecture and Design, 3(3-0)

Class Time&Place:
MWF, 11:00-11:50AM, ENGC 104

Catalog description, including prerequisites:
Basic computer organization, data representation and arithmetic, instruction sets and addressing modes, assembly language, data path and control, memory, input and output, and communication. Prerequisites: EEEN3449 or CSEN 2330 and EEEN2340.

Name of instructor and academic rank, office location, phone and fax numbers, email address:
Muhittin Yilmaz, Associate Professor of EE/CS,
Engineering Complex 308
Phone: (361) 593-2625, Fax: (361) 593-4026,
Email: muhittin.yilmaz@tamuk.edu

Office Hours (minimum of 10 hours per week, daytime hours preferred):
MWF 9:55-10:55AM and 11:55AM-12:55PM
R 9:55AM-1:55PM

Course learning objectives:
The students in this course will be able to understand and describe computer components as well as associated design principles.

Required and optional textbooks:

Suggested readings:
All computer architecture books and online materials are strongly suggested.

Student learner outcomes:
At the completion of this course, students will have
(a) An ability to apply knowledge of mathematics, science, and engineering,
(c) An ability to identify, formulate, and solve engineering problems.
Methods of evaluation and grading procedures:

Exam-I  20%
Exam-II 20%
Quizzes 15%
Projects 15%
Final  30%

There will be two midterms and a final exam. The exams will be cumulative and closed book-notes. Take-home type is a possibility for the exams. Planned and/or pop-style quizzes will be given to test the concepts and to ensure attendance. Quizzes may have different time durations or point values depending on subjects. Missing a quiz due to an unexcused absence will result in a zero grade. There are two types of projects: several individual short projects and one team final project, both of which are aimed toward synthesis of theoretical concepts and engineering analysis, design and applications. While short projects will focus on topics covered, the final project will involve comprehensive study of a contemporary issue in detail. The final project technical findings and evaluation may be assessed, at the instructor’s discretion, during the oral presentation by the instructor and the classmates. The final course grades will be assigned to reflect the subject comprehension scale that is determined by the instructor.

Policies for attendance, excused absences, make-up exams, late assignments, early final exams, cell phones, etc.:

Successful performance in this class requires that you regularly attend. Make-ups for missed class work are granted only for excused (official university) absences or with prior instructor approval. Please note the College of Engineering attendance policy. No late assignments will be accepted. The final exam will strictly follow the university schedule. Students should turn off and stow their mobile electronic devices, e.g., cell phones, during classes.

Topical course outline/course schedule:

Introduction to Computer Architecture and Design (1 Week)
Data Representation and Arithmetic Operations (2)
Digital Logic Components (1)
The instruction Set Architecture (2)
Machine Languages (1)
Datapath and Control (2)
Memory Operations (3)
Input and Output (2)
Pipelining (1)

Disability statement:

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disability. If you believe you have a disability requiring
an accommodation please contact the Disability Resource Center (DRC) as early as possible in the term. DRC is located in the Life Service and Wellness building at 1210 Retama Drive, or call (361) 593-3024.

**Academic misconduct, Forms of academic dishonesty, Nonacademic misconduct, Harassment/Discrimination:**

See *Student Code of Conduct* section of the Student Handbook, which can be accessed from the Dean of Students website: [http://osa.tamuk.edu/dean/](http://osa.tamuk.edu/dean/)

**Prepared by:**
Muhittin Yilmaz (August 23, 2013)

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### Student Outcome: (a) Ability to apply knowledge of mathematics, science, and engineering.

<table>
<thead>
<tr>
<th></th>
<th>Unsatisfactory 1</th>
<th>Developing 2</th>
<th>Satisfactory 3</th>
<th>Exemplary 4</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apply of Mathematics and Science</strong></td>
<td>Has conceptual problem and cannot apply math and science (data representation, arithmetic manipulations, digital logic) to engineering problems.</td>
<td>Minimally understands and tries to apply math and science principles toward solving engineering problems.</td>
<td>Adequately understands and applies appropriate math and science principles. Handles algebra, digital numbers-logic and calculus with minor error.</td>
<td>Understands and applies appropriate math and science principles. Handles algebra, digital numbers-logic and calculus with almost no error.</td>
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<tr>
<td><strong>Apply of Engineering Topics</strong></td>
<td>Does not recall or incorrectly applies fundamental engineering knowledge (Computer architecture, memory operations, etc.).</td>
<td>Tries to identify and understand problems. Solves problems with frequent errors.</td>
<td>Frequently identifies and understands problems. Solves problems with minor error</td>
<td>Always identifies and understands problems. Solves problems with almost no error.</td>
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</tbody>
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### Student Outcome: (e) Ability to identify, formulate, and solve engineering problems.

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<thead>
<tr>
<th></th>
<th>Unsatisfactory 1</th>
<th>Developing 2</th>
<th>Satisfactory 3</th>
<th>Exemplary 4</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identifies Engineering Problems</strong></td>
<td>No conceptual understanding of the problem.</td>
<td>Minimal conceptual understanding of the problem.</td>
<td>Basic conceptual understanding of the problem.</td>
<td>Complete understanding of the problem.</td>
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<tr>
<td><strong>Formulates Engineering Problems</strong></td>
<td>Cannot describe the problem.</td>
<td>Simple formulation with limited errors.</td>
<td>A correct formulation of the problem.</td>
<td>A clear, correct statement indicating the nature and purpose of each factor in the formulation.</td>
<td></td>
</tr>
<tr>
<td><strong>Solves Engineering Problems</strong></td>
<td>Unable to solve the problem.</td>
<td>Reasonable attempt at solution.</td>
<td>Correct solution to formulation.</td>
<td>Correct solution presented and interpreted in a broader context.</td>
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</tr>
</tbody>
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Average: