King Fahd University of Petroleum and Minerals  
College of Computer Science and Engineering  
COMP. ENGINEERING DEPARTMENT  

COE 205  
Computer Organization & Assembly Language  
Syllabus – Term 061  

Catalog Description  
Introduction to computer organization – Signed and unsigned number representation 
– Character representation – ASCII codes – Assembly language programming:  
instruction format and type, memory and I/O instructions, dataflow, arithmetic and  
logic instructions, flow control instructions, addressing modes, stack operations and  
interrupts – Datapath and control unit organization – RTL, microprogramming and  
hardwired control – Practice of assembly language programming.  

Prerequisite: COE 200 and ICS 201  

Instructor  
Dr. Abdelhafid Bouhraoua  
Room: 22/137-1  
Phone: 2178  
Email: abouh@ccse.kfupm.edu.sa  

Office Hours  
SMW  9:00 AM – 11:00 AM (and by appointment)  

Course Objectives  
1. Comprehend computer organization and how a computer system works  
2. Proficiency in assembly language programming in general and for the 80x86  
family in particular. Ability to program efficiently in assembly language by  
understanding the advantages and constraints of such an exercise. The student  
should be able to analyze, debug and test programs written in assembly language.  
3. Knowledge of computer organization and CPU organization. CPU-Memory  
interaction. Input/Outputs and buses. Knowledge of CPU internal typical  
arquitectures. Datapath architecture and Control unit architecture.  

Course Outcome  
1. Knowledge of basic computer organization, information representation, and basic  
assembly language concepts.  
2. Ability to analyze, design, implement, and test assembly language programs.  
3. Ability to use tools and skills in analyzing and debugging assembly language  
programs.  
4. Ability to design the datapath and control unit of a simple CPU.
5. Ability to demonstrate self-learning capability.

6. Ability to work in a team.

Textbook References


Grading Policy

- Laboratory 20%
- Quizzes and Assignments 25%
- Major Exam 1 and Major Exam 2 35%
- Final 20%

- Assignments include written and programming assignments
- Lowest two, three or four marks of the quizzes and assignments dropped
- Lowest exam counted as 15% and highest exam counted as 20%
- Assignments are to be submitted in class or by email in the specified due date.
- Late assignments will be accepted for five days after the due date and be penalized 10% per each late day

Exam Dates

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<tr>
<th>Exam</th>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>Major Exam 1</td>
<td>Monday October 9th 2006</td>
<td>9:00-11:00 PM</td>
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<td>or Saturday Nov. 4th 2006</td>
<td>7:00-9:00 PM</td>
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<tr>
<td>Major Exam 2</td>
<td>Wednesday December 13th 2006</td>
<td>7:00-9:00 PM</td>
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<tr>
<td>Final Exam</td>
<td>Saturday January 20th 2007</td>
<td>7:30-9:30 AM</td>
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Course Topics

1. **Introduction and Computer Organization** – 2 weeks

2. **Assembly Language Concepts** – 2 weeks
   Assembly language vs. high-level language. Assembly language format. Directives vs. instructions. Constants and variables. Addressing modes

3. **Pentium Assembly Languages Programming** – 6 ⅓ weeks

4. **CPU Design – 4 weeks**
CPU design fundamental parameters and consequences. Register transfer.

5. **Instruction Format Design Issues - 1½ weeks**
Goals and practices in designing instruction formats. Fixed vs. variable formats. Format lengths. Number of arguments.

**Ethics Policy**
- All assignments are individual and only individual work will be accepted. Detected copies of assignments (written or programming assignments) will result in zeros for the whole group (including the student who actually solved the problem).
- Using unauthorized information or notes on an examination, peeking at others work, or altering a graded exam to claim more grades are severe violations of academic honesty. Remember that if you cheat, you are cheating no one but yourself. Detected situations will result in failing grades in the course, and depending on the severity of the situation, some cases may possibly end up in suspension from the university.