

## KFUPM : EE 390-Digital System Engineering : Term 071

Instructor: Dr. Sheikh Sharif Iqbal      Subject: EE 390-1&4    Location: 59-2024  
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**Office Hour:** SMW- 11:10-11:40    AND    UT- 10:10-10:50    OR    by appointment

TOPICS	Week	DATE	Laboratory	Assignments
<b>Ch 1: Overview of <math>\mu</math>C/<math>\mu</math>P systems; 8086/8088 <math>\mu</math>P internal architecture, Ch 2: Software model; memory addresses;</b>	1	Sept. 8 -12	No Lab.	<u>Ch1 Problems:</u> 1 - 16, 18, 24, 28, 32, 33, 37, 40, 42, 43, 47, 48, 49
Data types, Memory segments; Internal registers and Flags; Memory address and Stack (briefly);	2	Sept. 15 - 19	<u>Experiment 0:</u> PC Hardware...	<u>Ch2 Problems:</u> 2.1-2.3, 2.8 - 2.10, 2.11 - 2.19, 2.23 - 2.27, 2.34, 2.37, 2.41, 2.46, 2.48, 2.53 - 2.60, 2.64, 2.65
<b>Ch 4.1-4.3: Machine code, Brief discussion on DEBUG commands Ch 3:Addressing modes and MOV ins.</b>	3	Sept. 22 - 26	No Lab.	<u>Ch4 Problems:</u> 4.7 - 4.17, 4.27 <u>Ch3 Problems:</u> 3.3 - 3.11
Ch 7: Introduction to Directives (DB, DW.....) ; EDIT, TASM, TLINK programs Ch 5: Data transfer instructions; INT 21;	4	Sept. 29 – Oct.3	<b>1. Introduction to Debug &amp; Turbo..</b>	<u>Ch7 Problems:</u> 7.2 - 7.6, 7.10 – 7.16, <u>Ch5 Problems:</u> 5.1 - 5.5
<b>Id al-Fitr Vacation October 4<sup>th</sup>- 19<sup>th</sup></b>				
<b>Ch 5: Arithmetic instructions; Ch 5: Logical instructions; -----</b>	5	Oct. 20- 24	No Lab.	<u>Ch5 Problem:</u> 5.6– 5.9, 5.10 – 5.17, 5.20– 5.25, 5.26 – 5.35, 5.39, 5.47
<b>Ch 5: Shift and Rotate instructions; Ch 6: Flag control, Compare instruction; Ch 6: Jump Instructions;</b>	6	Oct. 27- 31	<b>2. Addressing modes and data</b>	<u>Ch5 Problems:</u> 5.39, 5.43, 5.47, 5.49 <u>Ch6 Problem:</u> 6. – 6.5, 6.8, 6.15, 6.21, 6.22
Ch 6: Stack instructions and Subroutines; Ch 6: Loop and Strings instructions; BIOS & DOS Interrupts (INT-10, INT-21)	7	Nov. 3-7 <b>Exam 1: Nov 4, Sun, 5:15-7:00 PM</b>	<b>3. Arithmetic instructions ...</b>	<u>Ch6 Problem:</u> 6.25, 6.29, 6.31, 6.39, 6.43, 6.45, 6.48
<b>Useful Assambly language programs Ch 8.1-8.3: Memory Interface; Minimum mode of memory control;</b>	8	Nov. 10-14	<b>4. Shift and rotate .....</b>	<u>* Ass. Lang. Programs</u> <u>Ch8 Problems:</u> 8.7, 8.11, 8.16, 8.19,
<b>Ch 8.4:Maximum mode of memory control Ch 8.5-8.7:System clock, Bus cycle .....</b> ; <b>Ch 8.8: Hardware organisation of memory;</b>	9	Nov. 17-21	<b>5. Using BIOS Services (Part 1)</b>	<u>Ch8 Problems:</u> 8.23, 8.31, 8.37, 8.40, 8.43, 8.49
<b>Ch 8.14-8:17: I/O Data Tranfer &amp; Instruc, Ch 10.1-10:4: Isolated Bytewide I/O Ports; Input/Output handshaking .....</b>	10	Nov. 24-28	<b>6. Using BIOS Services (Part II)</b>	<u>Ch8 Problems:</u> 8.84 – 8.87, 8.89, 8.91, 8.93, 8.96, 8.99, 8.100, 8.101, 8.103, 8.105
<b>Ch 10.5- 10.6: The 82C55A (PPI) I/O interface chip; 8255A parallel I/O ports;</b>	11	Dec. 1-5	<b>7. Introduction to Flight86...</b>	<u>Ch10 Problems:</u> 10.3, 10.5, 10.8 – 10.10, 10.12 10.14, 10.17, 10.23, 10.25, 10.26
<b>Ch 10.7: Memory mapped I/O Interface; Ch 8.9-8:12: Memory Read/Write Bus ; Memory Circuits.,Ch 8.18: I/O read/write</b>	12	Dec. 8-12	<b>8. Flight86 - I: Traffic Lights</b>	<u>Ch10 Problems:</u> 10.32 – 10.35, 10.37 <u>Ch8 Problems:</u> 8.57, 8.63, 8.64, 8.108
<b>Id al-Adha Vacation Dec. 13<sup>th</sup>- 28<sup>th</sup></b>				
<b>Ch 9.1- 9:3: ROM,PROM,EPROM (prog. storage)RAM,SRAM,DRAM (data storage); Ch 9.5: Introduction to Flash</b>	13	Dec. 29- Jan. 2	<b>9. Flight86 - II: Motor Control</b>	<u>Ch9 Problems:</u> 9.2, 9.6 9.8, 9.11, 9.14, 9.16, 9.17, 9.21, 9.28, 9.29
<b>Introduction to the 8051 Microcontroller, Basic Microcontroller Programming</b>	14	Jan. 5- 9 <b>Exam 2: Jan. 6, Sun, 5:15-7:00 PM</b>	<b>10. Introduction to the 8051 Microcontroller</b>	
<b>Review</b>	<b>15</b>	Jan. 12- 16	<b>LAB FINAL</b>	

**Textbook :** 'The 8088 and 8086 Microprocessors' by Triebel and Singh latest edition.

**Grading:** CW/Project/HW 20% ; Major-1 15% ; Major-2 15% ; Final-exam 30% ; Lab 20%

**Major Exams:** **Exam 1; Sunday; 4<sup>nd</sup> Nov. ; 17:15 - 20:00 PM ; Room: 6 - 125**

**Exam 2; Sunday; 6<sup>th</sup> Jan. ; 17:15 - 20:00 PM ; Room: 6 - 125**

**Absences:** University rules: -- 4 unexcused absences → **Warning** ; -- 6 unexcused absences → **DN**.