Lesson Plan

Faculty: Dr. Sapna Prabhu

TE Electronics, Semester V
July 2019 – October 2019
Microcontrollers and Applications **(ELX 501)**

Lecture	***4***	
Practical	***2***	
Tutorial	***--***	
	Hours	***Marks***
Theory examination	3	80
Internal Assessment	--	20
Oral/Practical Examination	--	25
Term work	--	25
Total	--	150

Day	***Time***
Monday	1.30 pm-2.30 pm
Tuesday	8.45 am-9.45 am
Wednesday	9.45 am-10.45 am
Friday	3.30 pm-4.30 pm

Lecture No.	**Date**		**Topic**	**Remarks(If any)**
	Planned	**Actual**		
1	1/7/2019	1/7/2019	Introduction	
2	3/7/2019	3/7/2019	8051 Architecture	
3	4/7/2019	4/7/2019	Pin Diagram	
4	5/7/2019	5/7/2019	Memory organization	
5	8/7/2019	8/7/2019	Machine cycles and clock generation	
6	15/7/2019		Addressing modes, Instruction set	
7	16/7/2019		Instruction set	
8	17/7/2019		Instruction set	
9	18/7/2019		Assembly language programming (Delay	

			calculation)	
10	19/7/2019		Assembly language programming	
11	22/7/2019		Embedded C programming	
12	23/7/2019		Embedded C programming	
13	24/7/2019		Embedded C programming	
14	26/7/2019		I/O port structure	
15	29/7/2019		I/O port programming.	
16	30/7/2019		Introduction to Timer /Counter Operation	
17	31/7/2019		Timer Programming	
18	2/8/2019		Timer Programming	
19	5/8/2019		Serial Port Introduction	
20	6/8/2019		Serial Port Programming	**Assignment 1**
21	7/8/2019		Serial Port Programming	
22	9/8/2019		8051 Interrupt structure	
23	19/8/2019		8051 Interrupt programming	
24	20/8/2019		External memory interfacing and memory access cycles, polled I/O, Interrupt I/O	
25	21/8/2019		Display interfacing: 7-segment LED display, 16x2 generic alphanumeric LCD display.	
26	23/8/2019		**Quiz session**	
27	26/8/2019		4x4 matrix keyboard interfacing	
28	27/8/2019		8-bit parallel ADC interfacing	
29	28/8/2019		8-bit parallel DAC interfacing	
30	30/8/2019		Temperature (resistive, diode based) sensor, optical (photodiode/ phototransistor, LDR) sensors	
31	9/9/2019		**Design Activity**	**Flip-Classroom**

				Activity
32	11/9/2019		Electromagnetic relay, Stepper motor interfacing,	
33	13/9/2019		Servo Motor, Switch interfacing, SCR firing circuit (with electrical isolation)	**Assignment 2**
34	16/9/2019		Arduino programming	**Beyond Syllabus Activity**
35	17/9/2019		Comparison of CISC & RISC architectures	
36	18/9/2019		Overview of ARM family	
37	20/9/2019		ARM Cortex-M3 architecture	
38	23/9/2019		Programmer's model: Operation Modes and States	
39	24/9/2019		Registers, special registers, Application Program Status Register	
40	25/9/2019		Integer status flags, Q status flag, GE bits	
41	27/9/2019		Memory system: Features and memory map Memory system: Features and memory map	
42	30/9/2019		Exceptions and Interrupts Nested vectored interrupt controller	
43	1/10/2019		**Quiz session/Open Book test**	
44	4/10/2019		Revision	
45	7/10/2019		Revision	
46	9/10/2019		University Paper Solving	
47	11/10/2019		University Paper Solving	

Text- Books:

1.M. A. Mazidi, J. C. Mazidi, Rolin D. McKinlay,"The 8051 Microcontroller and Embedded Systems Using Assembly and C", Pearson Education, 2nd Edition.
2.Joseph Yiu,"The Definitive guide to ARM CORTEX-M3 & CORTEX -M4 Processors", Elsevier, 2014, 3rdEdition.

Reference Books:

1.Kenneth J. Ayala,"The 8051 Microcontroller", Cengage Learning India Pvt. Ltd, 3rdEdition.
2.David Seal, "ARM Architecture", Reference Manual (2nd Edition), Publisher Addison Wesley.
3.Andrew Sloss, Dominic Symes, Chris Wright,"ARMSystem Developers Guide: Designing and Optimising System Software", Publisher Elsevier Inc. 2004

Term Work:

At least 10 experiments based on the entire syllabus of Subject **EXC501 (Microcontrollers and Applications Laboratory)** should be set to have well predefined inference and conclusion. Few computation/simulation based experiments are encouraged. The experiments should be students' centric and attempt should be made to make experiments more meaningful, interesting and innovative. Term work assessment must be based on the **overall performance** of the student with **every experiment graded from time to time**. The grades should be converted into marks as per the **Credit and Grading System** manual and should be **added and averaged**. The grading and term work assessment should be done based on this scheme.

The final certification and acceptance of term work ensures satisfactory performance of laboratory work and minimum passing marks in term work.

Practical and Oral exam will be based on the entire syllabus.

Internal Assessment (IA):

Two tests must be conducted which should cover at least 80% of syllabus. The average marks of both the tests will be considered as final IA marks

End Semester Examination:

1. Question paper will comprise of 6 questions, each carrying 20 marks.
2. Total 4 questions need to be solved.
3: Question No.1 will be compulsory and based on entire syllabus wherein sub questions of 2 to 5 marks will be asked.
4: Remaining questions will be selected from all the modules.

Submitted By	**Approved By**
Dr. Sapna Prabhu	i) Dr. D.V.Bhoir Sign:
Sign:	ii) Prof. K. Narayanan Sign:
	iii) Prof. Shilpa Patil Sign:
	iv) Prof. Monica Khanore Sign:
Date of Submission:	**Date of Approval:**

Remarks by PAC (if any)