

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Department of Instrumentation and Control Engineering

COURSE OUTLINE TEMPLATE			
Course Title	Microprocessors and Microcontrollers Laboratory		
Course Code	IC 214	No. of Credits	2
Department	ICE	Faculty	Ms.V.SRIDEVI Ms. VAISHNAVI
Pre-requisites Course Code	-NIL-		
Course Coordinator(s) (if, applicable)	Ms. V. Sridevi		
Other Course Teacher(s)/Tutor(s) E-mail	sridevi@nitt.edu	Telephone No.	0431 250 3361
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		

COURSE OVERVIEW

This lab course exposes students to field of systems design using microprocessor and microcontrollers. The aim is to make the students design and develop a standalone embedded system using microcontrollers with the basics of 8085 microprocessor. This laboratory course will provide the practical experience on designing an embedded board with 8-bit microcontroller and develop a application software in C and assembly language.

COURSE OBJECTIVES

1. To make the students familiar with a microprocessor simulator to learn how a program gets executed in a Microprocessor /micro-controller.
2. To make the students fabricate a micro-controller circuit board using KiCAD open-source PCB design tool.
3. Program a micro-controller using a C language based compiler.

COURSE OUTCOMES (CO)

After completing this laboratory course, the students will be able to design, fabricate, implement and test their own micro-controller based systems.

Course Outcomes	Aligned Programme Outcomes (PO)
The students are able 1. Develop application code in Assembly and C language 2. The design, fabricates, implement and test their own microcontroller based systems.	1,2,3,4 4, 7,10,12

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery
1	1 and 2	Familiarization with 8085 microprocessor kit and its keyboard	Theoretical and practical analysis
2	2 and 3	Assembly language programs for 8-bit arithmetic operations using 8085 simulator	Theoretical and practical analysis
3	3 and 4	Assembly language programs for 16-bit arithmetic operations using 8085 simulator	Theoretical and practical analysis
4	4 and 5	Assembly language programs for sorting and searching operations using 8085 simulator	Theoretical and practical analysis
5	5 and 6	Assembly language programs for code conversion operations using 8085 simulator	Theoretical and practical analysis
6	6 and 7	Familiarization 8051 micro-controller board and its assembler.	Theoretical and practical analysis
7	7 and 8	LCD Interfacing with 8051	Theoretical and practical analysis
8	8 and 9	ADC and DAC Interfacing with 8051	Theoretical and practical analysis
9	9 and 10	Serial Interfacing with 8051	Theoretical and

			practical analysis
10	10 and 11	Interface a SPI compatible peripheral(RTC) with 8051 microcontroller	Theoretical and practical analysis
11	11 & 12	Interface a stepper motor with 8051 microcontroller	Theoretical and practical analysis
12	12 & 13	Interface a I ² C compatible Temperature sensor(LM75) with 8051 microcontroller	Theoretical and practical analysis

COURSE ASSESSMENT METHODS

The students are required to maintain a record of their work in the laboraory. Marks will be awarded based on the laboratory reports (pre and post lab) and in-lab performance. Laboratory reports must be submitted on time and in the required format. The students must design and build their own individual 8-bit microcontroller based application board to run the applications in microcontroller based experiments. The same board is to be used for coding during the final semester examination. If the students fail to submit their own functioning microcontroller development board during the final examination, only 'E' grade will be awarded for this laboratory course.

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Laboratory Record & viva-voce	--	---	45%
2.	Written Test –I	--	--	15%
3.	Written Test –II	--	--	15%
4.	Final Exam	--	--	25%

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

Text Book:

1. Ramesh Goankar, *Microprocessor Architecture, Programming and applications* with the 8085/8080A, 3rd Edition, Penram International Publishing house, 2002.
2. Kenneth J.Ayala, *The 8051 Micro controller*, Thomson Delmar Learning, 3rd Edition, 2004.

Reference Books:

1. Ram.B, *Fundamentals of Microprocessors and Microcontrollers*, 4thEdition, Dhanpatrai and sons, 1994.
2. Myke Predko, *Programming and Customizing the 8051 micro controller*, Tata-McGraw Hill, 3rd reprint 2007.
3. Frank Vahid/Tony Givargis, *Embedded System Design – A Unified Hardware/Software Introduction*, John Wiley & Sons, Inc, 2005 ISBN 9971-51-405-2.
4. Prasad K.V.K.K., *Embedded/Real-Time Systems: Concepts, Design & Programming*, Dreamtech Press, 2005.
- 1.

FOR SENATE'S CONSIDERATION

Course Faculty

Sriden
(V. SRIDEN)

CC-Chairperson

Goddin R. Bennet

HOD

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Date: 12.2.2016

