

DEPARTMENT OF INSTRUMENTATION AND CONTROL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN

COURSE OUTLINE			
Course Title	Microprocessors and Microcontrollers Laboratory		
Course Code	ICLR 15	No. of Credits	2
Department	ICE	Faculty	Dr. D. Ezhilarasi Mr. R. Yogarajan (A-Section)
Pre-requisites Course Code	Nil		
CourseTeacher Email	ezhil@nitt.edu	Mobile No.	9444878908
Course Type	Laboratory		
COURSE OVERVIEW			
<p>This lab course exposes students to the field of instrumentation system design using microcontrollers and processor. The aim is to teach the students about the design and development of standalone embedded system using microcontrollers and advanced processors. This laboratory course will provide the practical experience on design of embedded board with 8-bit microcontroller and develop application software in C and assembly language.</p>			
COURSE OBJECTIVES			
<ol style="list-style-type: none"> 1. To fabricate a micro-controller circuit board using KiCAD open-source PCB design tool. 2. To teach students on programming a microcontroller using a C language based compiler. 3. To familiarize with ARM and DSP processor with basic exercises. 			
COURSE OUTCOMES (CO)			
<p>On completion of this lab, the students will be able to,</p> <ol style="list-style-type: none"> 1. Program processor/ microcontroller using a C language based compiler. 2. Interface the peripherals with processor and microcontrollers. 3. Fabricate a microcontroller circuit board using KiCAD open-source PCB design tool. 			
Course Outcomes	Aligned Programme Outcomes (PO)		
<p>On completion of this lab, the students will be able to,</p> <ol style="list-style-type: none"> 1. Program processor/ microcontroller using a C language based compiler. 2. Interface the peripherals with processor and microcontrollers. 3. Fabricate a microcontroller circuit board using KiCAD open-source PCB design tool. 	<p>1,2,3,4, 7,10,12</p>		

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Weeks	Topic	Mode of Delivery
1	1 and 2	Familiarization of 8051 micro-controller board and its assembler.	Theoretical and practical analysis
2	2 and 3	LCD Interfacing with 8051	Theoretical and practical analysis
3	3 and 4	ADC Interfacing with 8051	Theoretical and practical analysis
4	4 and 5	DAC Interfacing with 8051	Theoretical and practical analysis
5	5 and 6	Serial Interfacing with 8051	Theoretical and practical analysis
6	6 and 7	Interface a SPI compatible peripheral(RTC) with 8051 microcontroller	Theoretical and practical analysis
7	7 and 8	Interface a I2C compatible Temperature sensor with 8051 microcontroller	Theoretical and practical analysis
8	8 and 9	Interface a stepper motor with 8051 microcontroller	Theoretical and practical analysis
9	9 and 10	Programming with ARM processor	Theoretical and practical analysis
10	10 and 11	Programming with DSP processor	Theoretical and practical analysis

ESSENTIAL READINGS : Reference books

1. Kenneth J.Ayala, The 8051 Micro controller, Thomson Delmar Learning, 3rd Edition, 2004.
2. Andrew N. Sloss, Dominic Symes, and Chris Wright, ARM System Developer's Guide: Designing and Optimizing System Software, Morgan Kaufmann Publishers, 2004.
3. Myke Predko, Programming and Customizing the 8051 micro controller, Tata-McGraw Hill, 3rd reprint 2007.
4. Prasad K.V.K.K., Embedded/Real-Time Systems: Concepts, Design & Programming, Dreamtech Press, 2005.

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Record preparation	-	-	60%
2	Written viva Test	4 th week of <i>October</i>	1 hour	15%
3	End sem practical Exam	1 st week of <i>November</i>	1 ½ Hour	25%

COURSE EXIT SURVEY

Written feedback from students during middle of the course

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

65 % attendance is must. Below 65 % attendance will be awarded V Grade (Redo)

Grading Policy

Relative grading based on normalized curve or Z-score will be followed


Reassessment Examination

- A student may, for valid reasons on production of valid medical certificate and with the approval of Head of the Department be permitted to withdraw from appearing for the End Sem Examination. Withdrawal application shall be valid only if it is made before the commencement of the examination.
- For students who miss the final sem assessment or failed in the subject, reassessment will be conducted for 40% mark and record marks remain same.
- Grades for the students who have withdrawn from writing the end sem exam will be same as the regular assessment grades. For those who are failed or absent and appearing for reassessment, the maximum grade is restricted to 'E'.
- Reassessment exam will be conducted in the first week of the next semester or earlier during the vacation.
- Students who fail in reassessment exam have to register for formative assessment.

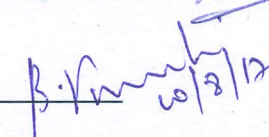
ADDITIONAL COURSE INFORMATION

The Course instructor is available for consultation at any time during office hours. Queries may also be emailed to the Course instructor directly at ezhil@nitt.edu

FOR SENATE'S CONSIDERATION

Course Faculty 
10/8/17

CC-Chairperson 

HOD 
10/8/17

Date: _____