NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

This course outline template acts as a guide for writing your course outline. As every course is different, please feel free to amend the template/ format to suit your requirements.

COURSE OUTLINE TEMPLATE			
Course Title	MICROPROCESSOR AND MICROCONTROLLER LABORATORY		
Course Code	ECLR13	No. of Credits	2
Department	ECE	Faculty	R.Thilagavathy
Co-requisites Course Code	ECPC18 MICROPROCESSORS AND MICROCONTROLLERS		
Course Coordinator(s) (if, applicable)			
Other Course Teacher(s)/Tutor(s) E-mail	thilagavathy@nitt.edu	Telephone No.	0431-2503313
Course Type	√ Core course	☐ Elective course	

COURSE OVERVIEW

This course deals with several languages used for programming a Microprocessors and Microcontrollers. The instructions are written as words called mnemonics rather than binary values and a program called an assembler translatesthe mnemonics into machine code. Some Microcontrollers use high level languages. The compiler produces machine code directly.

The industry standard Keil C compilers, Macro Assemblers, Debuggers, Real time kernals, and single board computers support all the Microcontrollers. Intelligent schematic input system provides the development environment for PROTEUS VSM, the revolutionary interactive system level simulator. This prouct combines mixed mode circuit simulation, Microprocessor models and interactive component models to allow the simulation of complete Microcontroller based designs.

COURSE OBJECTIVES

This course deals with the hands on experience on 16-bit Microprocessor, 8-bit and 16-bit Micro controllers. Interfacing the different peripherals with Microcontrollers.

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
After successful completion of the course the students are able to train their practical knowledge through laboratory experiments.	PO4, PO5, PO8 -H PO11, PO12 -M
	H-High M- Medium L=Low

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery

1	First week of January	Architecture, Addressing modes and Instruction set of 8086 Microprocessor Emulator 8086	Chalk & Talk, PPT Demo
2	Second week of January	Addressing modes of 8086 Microprocessor.	Hands on experience (Experiment -1)
3	Third week of January	Block move and simple arithmetic operations.	Hands on experience (Experiment -2)
4	Fourth week of January	Identification and displaying the activated key using DOS and BIOS function calls.	Hands on experience (Experiment -3)
5	First week of February	Architecture, Addressing modes and Instruction set of 8051 Microcontroller Keil, Proteus VSM, ESA 51E trainer Kit	Chalk & Talk, PPT Demo
6	Second week of February	Addressing modes of 8051 Microcontroller.	Hands on experience (Experiment -4)
7	Fourth week of February	Delay generation - i) Nested loop and ii) Timers.	Hands on experience (Experiment -5)
8	First week of March	Toggling the ports and counting the pulses.	Hands on experience (Experiment -6)
9	Second week of March	LCD Interfacing.	Hands on experience (Experiment -7)
10	Third week of March	Generation of different waveforms using DAC (0808)	Hands on experience (Experiment -8)
11	First week of April	ADC interfacing.	Hands on experience (Experiment -9)
12	Second week of April	Architecture, Addressing modes and Instruction set of mixed signal Microcontroller Code Composer studio	Chalk & Talk, PPT Demo
13	Third week of April	PWM generation and speed control of Motors using MSP430	Hands on experience (Experiment -10)
14	Fourth week of April	Redo lab (CPA)	

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Assessment -1 Recod	Submit every week after the completion of the experiment.		15 marks
2.	Assessment -2 Oral viva	Questions will be asked before doing the experiments.		10 marks
3.	Assessment -3 Internal lab exam (practical)	Third week of February	1 ½ Hours	20 marks
4.	Assessment -4 Viva Exam (MCQs-Written exam)	Fourth week of April	1 Hour	25 marks
5.	Assessment -5 External Lab Exam (Practical)	Fourth week of April	2 Hours	30 marks

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

Text Books:

1. J.L.Antonakos, "An Introduction to the Intel Family of Microprocessors", Pearson, 1999.

2. M.A.Mazidi & J.C.Mazidi "Microcontroller and Embedded systems using Assembly & C. (2/e)", Pearson Education, 2007.

3. John H. Davies, "MSP430 Microcontroller Basics", Elsevier Ltd., 2008

Reference Books

1. B.B. Brey, "The Intel Microprocessors, (7/e), Eastern Economy Edition", 2006.

2. K.J. Ayala, "The 8051 Microcontroller ", (3/e), Thomson Delmar Learning, 2004.

3. I. S. MacKenzie and R.C.W.Phan., "The 8051 Microcontroller. (4/e)", Pearson education, 2008.

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

> **Course feedback is assessed through**
> 1. Class committee meeting
> 2. Course exit survey form
>
> **Course Attainment is calculated through**
> 1. Direct tools (Exams)

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

Correspondence: All the students are advised to come to class regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be intimated in class/ over phone/ in faculty room / through their webmail.

Attendance:

1. All the students should maintain minimum 75 % of physical attendance in these contact hours to attend the end semester exam.
2. Any student who fails to maintain 75% attendance only on reasonable medical grounds needs

to appear for the compensation assessment (CPA) classes. On successful completion of CPA classes along with assessment criteria will be eligible for attending the end semester examination.

3. Students not having 75% minimum attendance at the end of the semester and also fail to attend CPA classes will have to appear for FORMATIVE ASSESSMENT.

Assessment:
1. Attending all the assessments is MANDATORY for every student.
2. If any of the student is not able to complete all the experiments due to genuine reason (any academic related work through department or medical grounds only), may appear for attending the Repeat lab.
3. Submission of record is MANDATORY for every student within the stipulated time failing which 15% weightage will not be considered for final grade assessment.
4. Finally, every student is expected to score minimum 40% of the maximum mark of the class in the total assessment (1, 2, 3, 4 and 5) to pass the course. Otherwise the student will be declared fail and 'F' grade will be awarded. Further the student can take up only FORMATIVE ASSESSMENT.

ADDITIONAL COURSE INFORMATION

Any queries send a mail to thilagavathy@nitt.edu
Hands on experience may be arranged from Industry.

FOR SENATE'S CONSIDERATION

R. Thilagavathy

Course Faculty _____   **CC-Chairperson** ___3.01.2017___   **HOD** _____ 3|1|2017