

Branch Name:	Signal Processing and Communication
Program Code:	ET214
Course Name:	Embedded System Design Practical
Course Code:	2ET2140201P
Pre-requisite Course:	Basic Knowledge of Analog Electronics, Digital Electronics, Microprocessors 8085 and 8086, Microcontroller 8051, Basic Knowledge of Computer Programming and C language

Course Objectives:

1. This course aimed to develop skills in the students related to Embedded System Design which introduces concepts of modern Microcontrollers and Microprocessors along with art of hardware and software designing for Electronics Systems.
2. This course also covers concepts of RTOS and DSP Processors which is the base for any Modern Electronics Systems.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	SEE		CCE		SEE		CCE						
	L	T	P	Total	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	-	-	2	2	-	-			10	25	10	25	50

Subject Contents			
Sr. No	Topic	Total Hours	Weight (%)
1	To verify and check the KEIL IDE and MPLABX IDE.	2	8
2	To implement I2C protocol on ARM / PIC platform.	2	8
3	To implement SPI protocol on ARM / PIC platform.	2	8
4	To implement Analog Sensor interfacing using ADC on ARM / PIC platform.	2	8
5	To implement UART and USB protocol on ARM / PIC platform.	4	18
6	To implement Speed control of DC motor using PWM on PIC platform.	4	18
7	To implement uC/OS-II or FreeRTOS on ARM Platform.	2	8
8	To Generate Sine Wave using DAC Module on ARM / PIC Platform.	2	8
9	To implement LPF and BPF on TMS320C6713DSK board using MATLAB, CCS.	2	8
10	To implement Reverberation on Real time Speech Signal on TMS320C6713DSK board using MATLAB, CCS.	4	8

List of Reference Books:

1. “ARM System-on-chip Architecture”, Steve Furber, 2nd Edition” Pearson publication.
2. “PIC Microcontroller and Embedded Systems”, Muhammad Ali Mazidi, Rolin McKinlay, Danny Causey 2008, Pearson Education.
3. “Interfacing PIC Microcontrollers Embedded Design by Interactive Simulation”, Martin P. Bates 2006, Elsevier Publications.
4. “PIC Microcontrollers –Know it all”, Lucio Di Jasio, Tim Wilmshurst, Dogan Ibrahim, John Morton, Martin P. Bates, Jack Smith, David W Smith, Chuck Hellebuyck 2007, Elsevier Publications.
5. “Programming Embedded Systems in C and C++”, Michael Barr, O'Reilly Publications
6. “Embedded C”,Michael J. Pont.
7. “DSP Applications Using C and the TMS320C6x DSK”,Rulph Chassaing.
8. “Digital Signal Processing and Applications with the C6713 and C6416 DSK”,Rulph Chassaing.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understand Embedded Systems and its need in today's electronics world.	1 Remembering 2 Understanding
CLO2	Understand the detailed concepts of PIC and ARM7 series of high end Microcontrollers which is mostly used in electronics applications.	2 Understanding 5. Evaluate
CLO3	Do the programming of microcontrollers with various dedicated IDEs with 'C' and C++ Language.	4 Analyze
CLO4	Design their own Embedded Systems for various applications.	3 Applying
CLO5	Learn the concepts of RTOS in its applications in embedded Systems.	3 Applying 4 Analyze
CLO6	Learn the DSP processors and its applications in high end Embedded Systems.	2 Understanding

Mapping of CLOs with POs & PSOs

[illegible]

CLO4		M	H		L			L					L		M	H
CLO5	H	M	H		L				L			H	L		M	H
CLO6	H	M	H		L							M	L		M	H

H: High, M: Medium, L: Low