

University of Computer Studies, Yangon
B.C.Sc./B.C.Tech.

CT-403	:	Introduction to Microcontrollers	First Semester
Text Book	:	Introduction to Microcontrollers by Gunther Gridling, Bettina Weiss	
Period	:	45 periods for 15 weeks (3 periods/week) (Lecture + Lab)	

Course Description

The purpose of this course is to teach students the fundamentals of microprocessor and microcontroller systems. The student will be able to incorporate these concepts into their electronic designs for other courses where control can be achieved via a microprocessor/controller implementation.

The internal structure and operation of microcontrollers will be studied. The design methodology for software and hardware applications will be developed through the labs and design projects. Additional projects for graduate students.

Course Objectives

The objective of this course is to teach students design and interfacing of microcontroller-based embedded systems. High-level languages are used to interface the microcontrollers to various applications. There are extensive hands-on labs/projects. Embedded system for sensor applications will be introduced.

References

1. Muhammad Ali Mazidi, Rolin D. Mckinlay, Danny Causey ‘ PIC Microcontroller and Embedded Systems using Assembly and C for PIC18’, Pearson Education 2008
2. John Iovine, ‘PIC Microcontroller Project Book ’, McGraw Hill 2000
3. Myke Predko, “Programming and customizing the 8051 microcontroller”, Tata McGraw Hill 2001.
4. Muhammad Ali Mazidi, Janice G. Mazidi and Rolin D. McKinlay, ‘The 8051 Microcontroller and Embedded Systems’ Prentice Hall, 2005.
5. Rajkamal,”.Microcontrollers-Architecture, Programming, Interfacing & System Design”, 2ed, Pearson, 2012.

6. I Scott Mackenzie and Raphael C.W. Phan, “The Micro controller”, Pearson, Fourth edition 2012
7. Muhammad Ali Mazidi, Rolin D. McKinlay, and Danny Causey, “The PIC Microcontroller and Embedded systems – Using Assembly and C for PIC18,” Prentice Hall, 2007

Assessment Plan for the Course

Paper Exam:	60%
Attendance:	10%
Test/ Quiz:	10%
Lab:	10%
Lab Assessment:	10%

Tentative Lecture Plan

No.	Chapter	Page	Period	Examples and Exercises
	Chapter 1 Microcontroller Basics	1-8	3	
1.	1-1 Introduction	1-5	2	
2.	1-2 Frequently Used Terms 1-3 Notation	6-7	1	
	Chapter 2 Microcontroller Components	11-71	20	
3.	2-1 Processor Core	11-21	4	
4.	2-2 Memory	22-32	4	
5.	2-3 Digital I/O	33-39	2	
6.	2-4 Analog I/O	40-51	4	
7.	2-5 Interrupts	52-60	2	
8.	2-6 Timer	60-67	2	
9.	2-7 Other Features	68-72	2	
	Chapter 3 Communication Interfaces	73-88	5	
10.	3-1 SCI (UART)	75-81	3	
11.	3-2 SPI 3-3 IIC (I ² C)	82-88	2	
	Chapter 4 Software Development	89-128	10	
12.	4-1 Development Cycle	91-96	3	
13.	4-2 Programming	97-116	4	
14.	4-3 Download	117-120	1	
15.	4-4 Debugging	121-126	2	

No.	Chapter	Page	Period	Examples and Exercises
	Chapter 5 Hardware	129-154	5	
16.	5-1 Switch/Button 5-2 Matrix Keypad 5-3 Potentiometer 5-4 Phototransistor 5-5 Position Encoder 5-6 LED 5-7 Numeric Display 5-8 Multiplexed Display 5-9 Switching Loads	129-139	3	
	5-10 Motors	140-152	2	
17.	Revision		2	All chapters