University of Computer Studies (Thaton)
2023-2024 Academic Year
Fourth Year (B.C.Tech.)
Lecture Plan

CT-4134 Embedded System I   **First Semester**

References.   :

[1] Introduction to Embedded Systems by Shibu KV, 2019.

[2] Real-time Embedded Systems by Jiacun Wang, 2017.

[3] Introduction to Embedded Systems Using ANSI C and the Arduino Development Environment by David Russell, 2010.

[4] A Practical Introduction to Real-time Systems for Undergraduate Engineering by Douglas Wilhelm Harder, Jeff Zarnett, Vajih Montaghami, Allyson Giannikouris, 2020.

[5] Embedded System Design, Embedded Systems Foundations of Cyber-Physical Systems, and the Internet of Things, 4th Edition, by Peter Marwedel, 2021.

[6] Introduction to Embedded Systems: A Cyber-Physical Systems Approach, 2nd Edition by Edward Ashford Lee and Sanjit Arunkumar Seshia, 2017.

[7] An Introduction to Microcontroller and Embedded Systems by Tyler Ross Lambert, 2017.

[8] Embedded Systems Design: A Beginner's Guide to Designing Embedded System Applications on Arm Cortex-M Microcontrollers by Ariel Lutenberg, Pablo Gomez, Eric Pernia, 2022.

Prerequisites : Computer Networks I

Period   **:** 64 periods for 16 weeks (4 periods * 16 weeks) (1 period – 1 hr)

No.	Chapter	Page	Period	Ref. No.	Detail Lecture Plan
	Chapter 1 Introduction to Embedded Systems	3-14	1	1	Overview
	Chapter 2 The Typical Embedded Systems	17-71	4		All Examples and Questions
1.	2.1 Core of Embedded System	17-28			
	Communication Interface	45-59			
2.	2.5 Embedded firmware	59-60			
3.	2.6 Other System Components	60-64			
4.	2.7 PCB and Passive Components	64			
5.	**Chapter 3 Characteristics and Quality Attributes of Embedded Systems**	**72-82**	1		Overview
6.	**Chapter 4 Embedded Systems-Application-and Domain-Specific**	**83-91**	1		Overview
7.	**Chapter 5 Designing Embedded Systems with 8bit Microcontrollers--8051**	**92-163**	4		All Examples and Questions

No.	Chapter	Page	Period	Ref. No.	Detail Lecture Plan
	Chapter 3 Real-Time Operating Systems	33-52	3		
31.	3.1 Main Function of General-Purpose Operating Systems	33-41			
32.	3.2 Characteristics of RTOS Kernels	42-47			
33.	3.3 RTOS Examples	48-50			
	Chapter 4 Task Scheduling	53-97	4		
	4.1 Task	53-59			
	4.2 Clock-Driven Scheduling	59-68			
	4.3 Round-Robin Approach	69			
	4.4 Priority-Driven Scheduling Algorithms	70-87			
	4.5 Task Assignment	89-97			

Lab Periods : 30

No.	Lab	Description
1.	Lab 1	
2.	Lab 2	
3.	Lab 3	
4.	Lab 4	
5.	Lab 5	
6.	Lab 6	Assembly Programming using 8051 Simulator (All Examples in Chapter-5)
	Group Project	

Assessment Plan for the Course

Exam : 60%

Tutorial : 10%

Lab : 10%

Quiz : 10%

Group Project : 10%