AMERICAN UNIVERSITY
OF CYPRUS

Course Code MH471	**Course Name** Embeded Systems	**ECTS Credit** 7.5
Pre-Requisite CS102	**Course Type** Major Elective	**Language of Instruction** English
Year of Study 3rd/ 6th	**Level of Course** BSc/1st Cycle	**Mode of Delivery** On Campus

Course Objectives:

The main objectives of the course are to:

• motivate the need for developing embedded system applications

• cover in detail the concepts of embedded systems and real-time operating system paradigms

• make students aware of the concepts of tasks, inter-process communication, synchronization, interrupts, and timers

• thoroughly discuss the presence of and describe the characteristics of latency in real-time system

• expose students to industrial development environment for embedded systems and industrial real-time operating systems

• introduce and discuss special concerns that real-time systems present and how these concerns are addressed.

Learning Outcomes:

After completion of the course students are expected to be able to:

1. explain the basics of embedded systems

2. identify what makes a system a real-time system

3. differentiate between developing “generic” software applications and embedded systems applications

4. apply the full life-cycle of developing embedded systems, i.e. design, software developing, build and load application to target host, and debug target host application.

5. critically assess reliability concerns and their implication for real-time embedded systems (failures, risks, and recovery).

Teaching Methodology:

Lectures 42 hours

Labs 30 hours

Course Content

1. Motivation and introduction to Real-Time Embedded Systems

2. Overview of the discipline of embedded systems including hardware architectures, software development environments (Tornado), and Real-Time Operating Systems (VxWorks)

3. Introduction to VxWorks and Tornado

4. Developing for embedded systems and embedded systems initialization

5. Introduction to Real-Time Operating Systems (RTOS)

6. Familiarization with RTOS concepts: tasks, semaphores, message queues, interrupts, timers, memory management, and synchronization and communication

7. Reliability of RTOS applications, their failure model, and recovery techniques.

Assessment Methods:

Final Exam

Mid-term/Lab Exam

Required Textbooks/Reading:

Title	**Author(s)**	**Publisher**	**Year**
Real-Time Concepts for Embedded Systems	Qing Li	CMP Books	2003
Real-Time Embedded Components and Systems	Sam Siewert	Charles River Media	2006