

SEMESTER II

Course Code: ELE-504

Course Title: EMBEDDED SYSTEMS DESIGNS

Number of Credits: 04

Total Hours: 60

Total Marks: 100

Effective from AY: 2022-23

Prerequisites for the course

Should have studied microprocessor and C programming at graduate level

Objectives of Course

This course is intended to:

- Introduce with Architectures of Microcontroller and its programming with Interfacing various Interfaces is discussed in depth in this paper.
- Programming in assembly as well as in C for 8/16/32 bit controller

Course Content

Unit I	Introduction to Controller Architecture	5 Hours
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Computer Architecture, RISC/CISC and Princeton Architectures

Unit II	Embedded system	5
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Definition, Basic Block, Designing of System, Applications

Unit III	8-bit Micro controllers	20
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Introduction to various 8-Bit microcontroller, 8051 features, Architecture , Memory organization, Instruction set, Interrupts, Timer/counter, LED, Switches, ADC, DAC, LCD Interfacing, Programming in Assembly and C,

Unit IV	16 bit microcontroller	15
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PIC controller Introduction, Architecture, Instruction set, Peripheral interfaces: LED, LCD, Serial RS232, Programming in C

Unit V	32-bit Microcontroller	15
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ARM architecture, THUMB/ARM instruction, ARM Exception Handling, Timers/Counters, UART, SPI, PWM, WDT, Input Capture, Output Compare Modes, I2C , Instruction set, Programming in Assembly and C.

Pedagogy

Lectures/Experiential Learning

Course Outcome

The students will:

- Students will learn the architecture of 8051, PIC and ARM .
- students will write an assembly and C program for 8051, PIC and ARM .
- students will write an assembly and C program for
- Students will be able to develop their own embedded platform using 8051, PIC and ARM

References/Readings

1. Jivan Parab et al., Exploring C for microcontroller (Springer 2007)

2. Lipovski G. J. Single and multiple Chip Microcontroller interfacing. Prentice Hall, USA 1998.
 3. Beginning Android 4 Application Development
 4. Professional Android 4 Application Development
- Learning Android Game Programming : A Hands-On Guide to Building Your First Android Game 1st Edition
- 5 .Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand,StamatisKarnouskos, David Boyle, "From Machine-to-Machine to theInternet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.
6. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet ofThings", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
7. Vijay Madiseti and ArshdeepBahga, "Internet of Things (A Hands-onApproach)", 1st Edition, VPT, 2014.