

ENG301 Microprocessor Programming

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JULY

Synopsis:

ENG301, Microprocessor Programming is intended to introduce the programming fundamentals of the ARMv7 microcontroller system, its instruction set, and the programming/control of ARMv7 based systems through the use of various LabVIEW functions. To enhance the understanding and application of ARMv7 microcontroller, the classical ARM architecture and assembly language programming, ARM organization and implementation and architecture support for system development are comprehensively discussed.

Topics:

- Introduction to LabVIEW
- Introduction to Cortex-M3 ARMv7M Architecture
- Different Functions of LabVIEW I
- Introduction to Processor Design
- Different Functions of LabVIEW II
- The ARM Architecture
- ARM Assembly Language Programming I
- ARM Assembly Language Programming II
- ARM Organization
- ARM Implementation
- Architecture Support for System Development I
- Architecture Support for System Development II

Learning Outcome:

- Examine the principles and basic concepts of National Instruments LabVIEW.
- Analyze ARM processor architecture and microcontroller configuration.
- Appraise the abstraction in hardware / software design and the trade-offs in processor design.
- Demonstrate the handling of ARM interrupts, data processing instructions, data transfer instructions and execution of programming languages.
- Sketch the ARM memory interface and advanced microcontroller bus architecture.
- Execute simple assembly language programs.
- Design systems based on: (a) ARM Microcontroller architecture (b) ARM Cortex™-M3 processor.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
CLASS TEST	8
PRE-CLASS QUIZ	2
PRE-CLASS QUIZ	2
CLASS TEST	8
PRE-CLASS QUIZ	2

LAB TEST	8
Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**