	INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS) **FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS** **DEPARTEMEN TEKNIK ELEKTRO** **Program Studi Magister (S2) Teknik Elektro**

1	**Nama Mata Kuliah / *Course Name***	:	Sistem Berbasis Mikroprosesor / *Microprocessor Based System*
2	**Course Code**	:	EE235242
3	**Kredit / *Credits***	:	3 SKS
4	**Semester / *Semester***	:	2

Deskripsi Mata Kuliah / *Course Description*

Mata kuliah ini mempelajari tentang Sistem Mikroelektronika yang terdiri dari sistem elektronika berbasis mikroprosesor dan mikrokontroler. Mata kuliah ini terdiri dari perkembangan mikroprosesor menuju mikrokontroler, tipe-tipe mikrokontroler, bahasa pemrograman, dan implementasinya yang meliputi mikrokontroler ARM 32 bit dan sistem komputer. Studi kasus implementasi sistem komputer dan mikrokontroler berbasis multithread programming.

This course studies Microelectronic Systems consisting of electronic systems based on microprocessors and microcontrollers. This course consists of the development of microprocessors to microcontrollers, types of microcontrollers, programming languages, and their implementations which include 32-bit ARM microcontrollers and computer systems. Case studies of the implementation of computer systems and microcontrollers based on multithread programming.

Capaian Pembelajaran Lulusan (CPL) Yang Dibebankan Mata Kuliah / *Program Learning Outcomes Charged to The Course*

1. (CPL-04) Mampu merancang dan melaksanakan eksperimen laboratorium dan/atau lapangan, menganalisa dan menginterpretasi data, serta menggunakan penilaian yang obyektif untuk menarik kesimpulan.

   (PLO-04) Able to design and carry out laboratory and/or field experiments, analyze and interpret data, and use objective judgment to draw conclusions.

2. (CPL-05) Mampu mendesain komponen, sistem, dan proses yang logis dan realistis sesuai dengan spesifikasi yang ditentukan dengan mempertimbangkan aspek keselamatan, sosial, budaya, lingkungan, dan ekonomi.

   (PLO-05) Able to design logical and realistic components, systems and processes according to specified specifications while considering safety, social, cultural, environmental and economic aspects.

Capaian Pembelajaran Mata Kuliah / *Course Learning Outcomes*
1. Memahami evolusi perkembangan mikroprosesor dan mikrokontroler / *Understanding the evolution of microprocessor and microcontroller development* 2. Memahami konsep GPIO, Timer, Counter, Interupt, Komunikasi Serial, I2C, CAN, Onewire untuk mikroprosesor dan mikrokontroler */ Understanding the concepts of GPIO, Timer, Counter, Interrupt, Serial Communication, I2C, CAN, Onewire for microprocessors and microcontrollers* 3. Memahami konsep bahasa C untuk pemrograman sistem mikroprosesor dan sistem mikrokontroler / *Understanding the concept of C language for programming microprocessor systems and microcontroller systems* 4. Mampu merancang dan implementasi sistem mikroprosesor / *Able to design and implement microprocessor systems* 5. Mampu merancang dan implementasi sistem mikrokontroler / *Able to design and implement microcontroller systems* 6. Mampu menerapkan pemrograman multithread / *Able to implement multithread programming*
Pokok Bahasan / *Contents*
1. Pengantar mikroprosesor dan mikrokontroler / *Introduction to microprocessors and microcontrollers* 2. GPIO, Timer, Counter, Interupt, Komunikasi Serial, I2C, CAN, Onewire. / *GPIO, Timer, Counter, Interrupt, Serial Communication, I2C, CAN, Onewire.* 3. GNU ARM Embedded Toolchain Bahasa C / *GNU ARM Embedded Toolchain C Language* 4. Pemrograman Mikrokontroler ARM 32bit / *ARM 32bit Microcontroller Programming* 5. Pemrograman Sistem komputer / *Computer System Programming* 6. Studi kasus multithread programming / *Multithread programming case study*
Prasyarat / *Pre-requisite*
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Pustaka / *Reference*
Utama / *Primary*: 1. Matt Richardson, Shawn Wallace, Getting Started with Raspberry Pi, O'Reilly Media, 2012 2. Manual Book STM32 3. Robert Love, Linux Kernel Development, Addison-Wesley, 2010 Pendukung / *Supporting*: 4. A. Koubaa, Robot Operating System (ROS): The Complete Reference (Volume 5). Springer Nature, 2020.