



# UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Department of Computer Science and Electronics

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## Doctoral Programme of Computer Science

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Module name : **EMBEDDED SYSTEM**

Module level, if applicable : **DOCTORAL**

Code, if applicable : MII7645

Semester(s) in which the module is taught : 1 (Odd)

Person responsible for the module : Dr. Agfianto Eko Putra

Lecturer(s) : Dr. Agfianto Eko Putra, Prof. Jazi Eko Istiyanto, Ph.D

Language : Indonesian

Relation to curriculum : Elective Course

Credit points : 3

Type of teaching, contact hours :

Workload : 84

Requirements according to the examination regulations : Minimum attendance at lectures is 75% (according to UGM regulation). Final score is evaluated based on assignments (20%), mid semester exam (40%), and end semester exam (40%).

Recommended prerequisite : Mathematics and Basic Programming

Module objectives/ intended learning outcomes :

- CO1: Students are able to explain the concept and philosophy of Embedded System.
- CO2: Students are able to explain the Embedded System Architecture.
- CO3: Students are able to explain the Microcontroller-based Embedded System.
- CO4: Students are able to explain the Single Board Computer-based Embedded System.
- CO5: Students are able to explain the FPGA-based Embedded System.
- CO6: Students are able to explain the research trends in Embedded System.

Content :  
1. Embedded System Architecture

	<ol style="list-style-type: none"> <li>2. Microcontrollers</li> <li>3. Single Board Computer</li> <li>4. Programmable SoC (System on Chip) - FPGAs</li> <li>5. Research Trends in Embedded System</li> </ol>
Study and examination requirements and forms of examination :	
Media employed :	slides, discussion, online and offline meeting
Reading List :	<ol style="list-style-type: none"> <li>1. Dubey, R, 2009, Introduction to Embedded Systems Design using Field- Programmable Gate Arrays, Springer-Verlag, London</li> <li>2. Goshal, S, 2009, Embedded Systems and Robots, Cengage Learning Asia Pte Ltd, Singapore</li> <li>3. Gridling, G, and Weiss, B., 2007. Introduction to Microcontrollers, Vienna University of Technology</li> <li>4. Pedroni, V.A., 2004. Circuit Design with VHDL, MIT Press, Cambridge, MA.</li> </ol>

#### The Mapping of COs to PLOs

COs	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CO1								
CO2								
CO3								
CO4								
CO5								
CO6								

#### The PLO of DP-CS

PLO	Knowledge Area	PLO Description
<b>PLO1</b>	[Values and principles]	A graduate should be devoted to God Almighty, uphold the humanity values, internalize academic values and ethics, responsible in working around expertise independently.
<b>Managerial Capability</b>		
<b>PLO2</b>	[Professional attitudes]	A graduate should have good interpersonal skills; able to work together within the organization, both as a leader and a member; able to be the initiator; able to manage and delegate tasks; and have a sense of responsibility for their own work as well as take responsibility for the achievement of the organization's work.
<b>PLO3</b>	[Communication skills]	A graduate should be able to communicate effectively and efficiently with stakeholders from various backgrounds; use

		English well; and able to write and present scientific papers correctly and well.
<b>PLO4</b>	[Life-long learning]	A graduate should be up to date with the state-of-the-art especially in computer science field, able to take parts in the development of computer science field that is engaged in and relate it to other fields throughout life.
<b>Working Capability</b>		
<b>PLO5</b>	[Problem-solving and Scientific skills]	A graduate should be able to analyse science and technology problems in the computer science field, develop alternative solutions through intra disciplinary, interdisciplinary, and trans disciplinary approaches to produce innovative, original, and tested works.
<b>PLO6</b>	[Ability to formulate and do research]	A graduate should be able to formulate research problems through critical, exploratory, and innovative studies both independently and in groups of computer science field that is engaged in and present research results in a scientific paper at regional or international level.
<b>Mastering Knowledge</b>		
<b>PLO7</b>	[Fundamental knowledge]	A graduate should be able to develop knowledge in the field of computer science that is engaged, which includes abstraction, complexity, evolution and philosophy of changes or developments in the field of science.
<b>PLO8</b>	[Applied knowledge]	A graduate should be able to develop theoretical, philosophical, and applied concepts in the field of computer science that is engaged in, and to represent them in a structured and systematic manner.