Communications and Computer Engineering II (ICT.A413)
(情報通信工学統合論 II)

Day/Period(Room No.): 3Q Mon 1-2 (S421), Thu 1-2 (S421) 2019.9.25

Course schedule 2019:

Day/Lecturer	Title/Abstract
1: Sep.26(Thu) Takahashi Atsushi	**Digital Integrated Circuits 1: Fundamentals** The basic components of digital integrated circuits and its behavior are introduced.
2: Sep.30(Mon) Takagi Shigetaka	**Analog Integrated Circuits 1: Fundamentals** Properties of basic elements for analog integrated circuits and its synthesis are introduced.
3: Oct.3(Thu) Takahashi Atsushi	**Digital Integrated Circuits 2: Synthesis** The basic of discrete structure and algorithm as well as advances of VLSI and its design methodologies are introduced.
4: Oct.7(Mon) Takagi Shigetaka	**Analog Integrated Circuits 2: Synthesis** Active inductor designs based on a simple circuit given in the first lecture from the viewpoints of power consumption and area efficiency are introduced.
5: Oct.17(Thu) Nakamoto Takamichi	**Digital Integrated Circuit Design using HDL** Design of digital integrated circuit using hardware description language (HDL) are explained.
6: Oct.21(Mon) Nakamoto Takamichi	**Computer System 1: Sensing System** Principle of a sensor based on its frequency change and its measurement circuit using FPGA are explained.
7: Oct.24(Thu) Masato Motomura	**Computer System 2: "AI" Hardware Architectures** Hardware-oriented approaches for accelerating "AI" workloads such as deep neural networks (DNNs) will be explored.
8: Oct.28(Mon) Isshiki Tsuyoshi	**Microprocessor 1 : Instruction-Set Architecture** Instruction-set architecture including assembly language and binary machine code and the basic functional behavior of microprocessor is explained.
9: Oct.31(Thu) Isshiki Tsuyoshi	**Microprocessor 2 : Processor Micro-architecture** Basic processor micro-architecture including register-file, memories, caches, instruction decoder and ALU are explained.
10: Nov.4(Mon) Sugino Nobuhiko	**Compiler 1: Fundamentals** Procedures of a compiler (Front-End, Intermediate Codes, and Back-End) are introduced.
11: Nov.7(Thu) Sugino Nobuhiko	**Compiler 2: Code Optimization Techniques** Various code optimization techniques and programming techniques for higher performance are given. And, then, code optimization techniques for embedded processors are discussed.
12: Nov.11(Mon) Hara Yuko	**Embedded Systems 1: Fundamentals and RTOS** Overview of embedded systems and fundamental technologies of embedded software, especially about real-time operating systems (RTOS) are introduced.
13: Nov.14(Thu) Hara Yuko	**Embedded Systems 2: Embedded Hardware Synthesis** High-level design methodologies of embedded hardware, such as high-level synthesis, are introduced.
14: Nov.18(Mon) Nakahara Hiroki	**Logic Functions and FPGA: Fundamentals** Complexity and functional decomposition of logic functions, and its application for the memory based circuit on the Field Programmable Gate Array are introduced.
15: Nov.21(Thu) Nakahara Hiroki	**Computer System 3: FPGA Applications** Trends for FPGA applicatoins are introduced.

Reference books, course materials, etc.:
Handouts will be distributed at the beginning of class when necessary

Assessment criteria and methods:
Learning achievement is evaluated by the quality of the written reports, exercise problems, and etc.

Related courses: ICT.A402 ： Communications and Computer Engineering I

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Contact each lecturer directly for each class and report.

Office hours: Contact by e-mail in advance to schedule an appointment