

System Architecture

科目番号		履修年度	2011年後期
開設学部等	理工学研究科(前期) 情報工学専攻 特別(情報)	期間	後期
曜日時限	月曜日 3時限	単位数	2
担当教員	和田 知久	講義コード	R0046400

■授業内容と方法

This course provide a detailed introduction of digital system design with stress of wireless communication system. The course begins with a wireless communication related signal processing basics and how to design such system with digital technology. Then, one of the state-of-the-art communication system such as OFDM will be deeply explained. Digital system components such as FPGA, LSI, DSP Devices will be deeply explained and shows how to use them in real life. As a second important topics: Error Correction basics will be covered and the state-of-the-art Error Correction system will be examined. Finally, the course try to cover the real large scale digital wireless communication system designed in WADA LAB and Magna Design Net as a one big example.

Digital signal processing simulation tool will be used in the course.

■達成目標

To understand a state-of-the-art Digital System with stress of Digital wireless communication system

The course will cover

- 1) Basics of wireless communication related signal processing
- 2) OFDM wireless communication system
- 3) Digital System Devices
- 5) Digital Error Correction and application
- 6) Recent achievements and examples of Large scale digital wireless communication system

■評価基準と評価方法

Home Works (20%) + Midterm exam or report (40%) + Final exam or report (40%)

■履修条件

■授業計画

- 1) Basics of wireless communication related signal processing
 - Fourier, complex signal, digital signal representation
- 2) OFDM wireless communication system
 - Digital Modulation
- 3) Digital System Devices
 - FPGA and LSI (Large Scale Integration) and how to design
 - Digital Signal Processor and how to use it
- 5) Digital Error Correction and application
 - Galois Field, Reed Solomon, Viterbi
- 6) Recent achievements and examples of Large scale digital wireless communication system
 - Digital TV, Adaptive array antenna system, Wireless LAN, WiMAX

■事前・事後学習

■教科書

ISBN

NONE, Lecture note will be distributed.	
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■参考書

ISBN

To be indicated in the lecture	
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■備考(メッセージ)

For ADVANCED SYSTEM ARCHITECTURE, Following task will be added.:

After several lectures, personal meeting will be arranged with negotiation. Then each doctor candidates have to propose each short research topics relating to digital system design. According to the proposal, they have to make short research paper as a Final course report. Personal meeting will be arranged roughly every two weeks with negotiation.

■オフィスアワー

Room: 1-605 Monday 15-16, Friday 11-12PM, Please make reservation before you come to the office.

■メールアドレス

wada@ie.u-ryukyu.ac.jp

■URL

<http://www.ie.u-ryukyu.ac.jp/~wada/lecture.html>