Course Information	
Course title	Digital Signal Processing in Vlsi Design
Semester	109-2
Designated for	COLLEGE OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE GRADUATE INSTITUTE OF ELECTRONICS ENGINEERING
Instructor	CHIA-HSIANG YANG
Curriculum Number	EE5141
Curriculum Identity Number	921 U9330
Credits	3.0
Course Syllabus	
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Course Description	1. Basics of VLSI signal processing 2. Architectural transformation 3. Iterative and bit-level arithmetic 4. Digital filters 5. FFT 6. Time and frequency analysis 7. Wordlength optimization 8. Basics of digital circuits 9. Power reduction 10. Circuit optimization 11. Low energy implementation 12. Ultra low power design 13. Design examples
Course Objective	1. 介紹數位訊號處理架構設計的基本技巧與常用模組 2. 本課程的重點是積體電路之硬體架構設計與低功耗電路設計
Course Requirement	Homework: 30% Midterm: 30% Final project: 40%
References	- D. Markovic and R. W. Brodersen: DSP Architecture Design Essentials, Springer, 2012 - K. K. Parhi, VLSI Digital Signal Processing Systems: Design and Implementation, Wiley, 1999

	- J. Rabaey, A. Chandrakasan, B. Nikolić, Digital Integrated Circuits: A Design Perspective, 2nd Edition, Prentice Hall 2003

Progress

Week	Date	Topic
第 1 週		Introduction
第 2 週		Basics of VLSI Signal Processing
第 3 週		Digital Filters
第 4 週		Iterative and Bit-Level Arithmetics
第 5 週		Fast Fourier Transform (FFT) Module
第 6 週		Time-Frequency Analysis
第 7 週		National Holiday
第 8 週		Basics of Digital Circuits, Power Reduction
第 9 週		Circuit Optimization
第 10 週		Low-Energy Implementations
第 11 週		Midterm
第 12 週		Ultra-Low Power/Voltage Design, Wordlength Optimization
第 13 週		Multi-Antenna Decoders
第 14 週		Bioinformatics/Biosignal Processors
第 15 週		ML for VLSI/AI Processors
第 16 週		Final Project Preview
第 17 週		AI Processors
第 18 週		Final Project Presentation