Digital Signal Processing

Course Name	Course type (credit/hours)	Elective course(3/3)	Course code	C003
	Target students Division/major/grade	Electrical and Computer Engineering/Junior	Opening semester	2019 2ND SEMESTER
	Class time and classroom	Tue D(WH317-1)Thu C(WH317-1)	English Grade	A(100%English)
Reference to this course	Prerequisite courses			
	Related basic courses			
	Recommended concurrent courses			
	Related advanced courses			

Instructor	Name (title/division)		Ran Rong(Assistant Professor, Electrical and Computer Engineering)			
	Office Room Number	종합관 603호	Office phone Number	2375	e-mail	
	Office hours			Homepage address		
Teaching Assistant	Name (title/division)					
	Office Room Number		Office phone Number		e-mail	

1. Introduction

Analysis and processing techniques used in digital signal processing.
1. Sampling of continuous signals and interpolation of discrete signals.
2. A/D and D/A conversion.
3. Time series analysis of waveforms, Z-transform, Complex convolution theorem.
4. Transform analysis of DLTI systems.
5. Introduction to FIR etc.

2. Course Objectives

To learn and understand theoretical fundamentals on digital signal processing and its applications as well as relevant programming skills.

3. Class types and activities

1. Lecture: introduce basic mathematical concepts of signals and systems
2. Exam: Midterm+Final term+Quiz
3. Project (optional)

4. Teaching Method

- [V] lecture
- [ ] discussion and debate
- [ ] team project(presentation and case studies)
- [ ] experiments(role-playing,etc)
- [ ] designing and production
- [ ] on-site learning(on-site training)
- [ ] others

5. Support Systems in Use

- [V] AjouBb
- [ ] automatic recording system
- [ ] web-based assignment
- [ ] cyber lecture
- [ ] online content
- [ ] class behavior analyazing system
- [ ] others

6. Teaching Tools

- [V] PBL(Problem Based Learning)
- [ ] CBL(Case Based Learning)
- [ ] TBL(Team Based Learning)
- [ ] UR(Undergraduate Research)
- [ ] FL(Flipped Learning)
- [ ] DSAL(Data Science Active Learning)
- [ ] others

7. Knowledge and ability required for taking this course

The course requires some background on SIGNALS and SYSTEMS & Matlab programming.

8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance	30	10%	
midterm exam	1	35%	
final exam	1	35%	
quiz	2	20%	
presentation			
discussion			
homework			
etc			
study hours			

9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
Main	Discrete-Time Signal Processing	Oppenheim and Schafer	Prentice Hall	

10. Class system and Class shedule

1. Discrete-time signals and systems
2. The Z-transform
3. Sampling of continuous-time signals
4. Transform analysis of linear Time-invariant systems
5. Filter Design techniques
6. Discrete Fourier Transform
7. Discrete Hilbert Transform

< Class Schedule >

* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	Introduction	E	Ran Rong			
2	Discrete-time systems: Definitions, DLTI system etc	E	Ran Rong			
3	Discrete-time systems: Frequency response and brief discussion of idea digital filter.	E	Ran Rong			
4	Concept of singular sequces	E	Ran Rong			

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Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
5	Basic concepts on Z-transform	E	Ran Rong			
6	Z-transform properties with demonstrating examples	E	Ran Rong			
7	The complex convolution Theorem	E	Ran Rong			
8	Midterm Exam	E	Ran Rong			
9	Reconstruction of bandlimited signals	E	Ran Rong			
10	Concept of anti-aliasing filter & Analog to Digital (A/D) conversion	E	Ran Rong			
11	Digital to analog conversion (D/A)	E	Ran Rong			
12	Transform analysis of DLTI systems	E	Ran Rong			
13	Frequency response for rational system functions	E	Ran Rong			
14	Stuctures for discrete-time systems	E	Ran Rong			
15	Discussion of digital filter design techniques	E	Ran Rong			
16	Final Exam	E	Ran Rong			

11. Other items of notification