

## Signals and Systems

Course Name	Course type (credit/hours)	Required course(3/3)		Course code	C096
	Target students Division/major/grade	Electrical and Computer Engineering/Sophomore		Opening semester	2017 2ND SEMESTER
	Class time and classroom	Tue D(WH539)Thu C(WH539)		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

The concepts of signals and systems arise in virtually all areas of technology, including electrical circuits, communication devices, signal processing devices, robotics and automation, etc. Therefore, it is of great importance for students of Engineering Department.

This course contains a comprehensive treatment of continuous-time and discrete-time signals and systems, with illustrations of numerous MATLAB commands for the solution of a wide range of problems arising in engineering fields.

Getting info About This Course

- The syllabus contains tentative information.
- I will announce in class if there is any change.
- You are responsible for making sure that you obtain this information.
- Come to classes on time and listen carefully for announcement(s).

### 2. Course Objectives

1. Understand what are continuous-time and discrete-time signals and systems, and what is relation between signals in time domain and frequency domain.
2. Understand what is the Fourier series and Fourier Transform, and Know how to use it to analyze Discrete-time signals and systems
3. Understand what is the Laplace Transform and Z-transform.

### 3. Class types and activities

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

### 4. Teaching Method

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> lecture                          | <input type="checkbox"/> discussion and debate              |
| <input type="checkbox"/> team project(presentation and case studies) | <input type="checkbox"/> experiments(role-playing, etc)     |
| <input type="checkbox"/> designing and production                    | <input type="checkbox"/> on-site learning(on-site training) |
| <input type="checkbox"/> others                                      |   |

### 5. Support Systems in Use

- |  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> e-class / AjouBb     | <input type="checkbox"/> automatic recording system | <input type="checkbox"/> web-based assignment |
| <input type="checkbox"/> cyber lecture                   | <input type="checkbox"/> online content             |   |
| <input type="checkbox"/> class behavior analyzing system | <input type="checkbox"/> others                     |   |

### 6. Teaching Tools

- |   |   |   |
|---|---|---|
| <input checked="" type="checkbox"/> PBL(Problem Based Learning) | <input type="checkbox"/> CBL(Case Based Learning) | <input type="checkbox"/> TBL(Team Based Learning)           |
| <input type="checkbox"/> UR(Undergraduate Research)             | <input type="checkbox"/> FL(Flipped Learning)     | <input type="checkbox"/> DSAL(Data Science Active Learning) |
| <input type="checkbox"/> others                                 |   |   |

### 7. Knowledge and ability required for taking this course

The background required for studying this course consists of the usual courses in calculus and elementary differential equations. It is also helpful, but not necessary, to have had some exposure to physics.

## 8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance		10%	If the absence rate is over 25%, F will be given!
midterm exam		30%	
final exam		30%	
quiz		20%	
presentation			
discussion			
homework	4	10%	
etc			
study hours			

## 9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
Main	Fundamentals of signals and systems using the web and matlab	Edward w. Kamen	prentice hall	

## 10. Class system and Class shedule

<ol style="list-style-type: none"> <li>1. continuosu-time &amp; discrete-time signals;</li> <li>2. Discrete-time systems;</li> <li>3. The Fourier Series &amp; Transform;</li> <li>4. The Laplace &amp; Z transform.</li> </ol>
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### < Class Schedule >

\* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	Continuous-Time Signals	E	Ran Rong	Lecture Notes		
2	Discrete-Time Signals & systems	E	Ran Rong	Lecture Notes		
3	Discrete-Time systems	E	Ran Rong	Lecture Notes & Matlab		
4	Discrete-Time systems	E	Ran Rong	Lecture Notes & Matlab		
5	Frouier series & Transforms	E	Ran Rong	Lecture Notes		

## < Class Schedule >

\* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
6	Fourier Transforms	E	Ran Rong	Lecture Notes & Matlab		
7	Fourier Analysis of Discrete-Time signals	E	Ran Rong	Lecture Notes		
8	Midterm	E	Ran Rong	Lecture Notes & Matlab		
9	Fourier Analysis of Continuous-Time Systems	E	Ran Rong	Lecture Notes & Matlab		
10	Fourier Analysis of Discrete-Time Systems	E	Ran Rong	Lecture Notes & Matlab		
11	The Laplace Transform and Transfer function representation	E	Ran Rong	Lecture Notes & Matlab		
12	The Inverse Laplace Transform	E	Ran Rong	Lecture Notes & Matlab		
13	The Z-Transform of a discrete-time systems	E	Ran Rong	Lecture Notes & Matlab		
14	The inverse Z-Transfer	E	Ran Rong	Lecture Notes & Matlab		
15	Analysis using the Z-transfer	E	Ran Rong	Lecture Notes & Matlab		
16	Final Exam	E	Ran Rong			

## 11. Other items of notification

This course requires students have some background on Matlab.