

# ❖ ECE\_0402(Signals, Systems & Probability)

## Instructor : Jeungphill Hanne

### ❖ Agenda for today

#### 1. SCUPI 2024 Spring Academic Calendar

- Academic Calendar : Midterms & Final etc.
- My Schedule : Office hours etc.

#### 2. Course Introduction

- Course information
  - Subject, Text book, Lecture Hour, Office hour, Course website, etc.
- Course Objective & Scope, Course Learning Key Points
- Course Grading & Tentative Course Schedule

#### 3. Brief Introduction of the **LTI System (Linear-Time-Invariant)**

- What is the Electric currents and the Electric voltages?
- What is the Electric circuits and for what purpose?

# 1. SCUPI 2024 Spring Academic Calendar

- Academic Calendar : Midterms & Final etc.

SCUPI Academic Calendar for 2023-2024 Spring

	Feb.	Mar.				Apr.				May					Jun.				Jul.					Aug.			
<b>Monday</b>	26	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26
<b>Tuesday</b>	27	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27
<b>Wednesday</b>	28	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28
<b>Thursday</b>	29	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29
<b>Friday</b>	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30
<b>Saturday</b>	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31
<b>Sunday</b>	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	1
<b>SCU Week</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
<b>SCU Term</b>	2024 Spring Teaching Weeks																			Summer Recess							

**Notes:**  
 Classes begin: February 26  
 Tomb Sweeping Day:  
 May Day: May 1  
 Dragon Boat Festival:  
 International Weeks & Military Training (Freshmen):

1<sup>st</sup> Midterm

2nd Midterm

Final

*This schedule is preliminary!!*

# 1. SCUPI 2024 Spring Academic Calendar

- My Schedule : Office hours etc.

2023-2024 Fall Semester Course Schedule					
Class time	Monday	Tuesday	Wednesday	Thursday	Friday
08:15-09:00	Physics 2 02 3-104	Physics 2 03 3-103			
09:10-09:55	Physics 2 02 3-104	Physics 2 03 3-103			
10:15-11:00		Office Hour Physics 2 03	Physics 2 02 3-104	Physics 2 03 3-103	
11:10-11:55		Office Hour Physics 2 02	Physics 2 02 3-104	Physics 2 03 3-103	
Lunch Break					
13:50-14:35		Physics 1 01 3-310	Signals, Systems & Probability 3-104	Physics 1 01 3-310	
14:45-15:30		Physics 1 01 3-310	Signals, Systems & Probability 3-104	Physics 1 01 3-310	
15:40-16:25		Office Hour Physics 1 01	Signals, Systems & Probability 3-104		
16:45-17:30		Office Hour Signals, Systems & Probability			
17:40-18:25					

*But, you can come to my office anytime when I am in my office ^^*

## 2. Course Introduction

- **Signals, Systems & Probability**

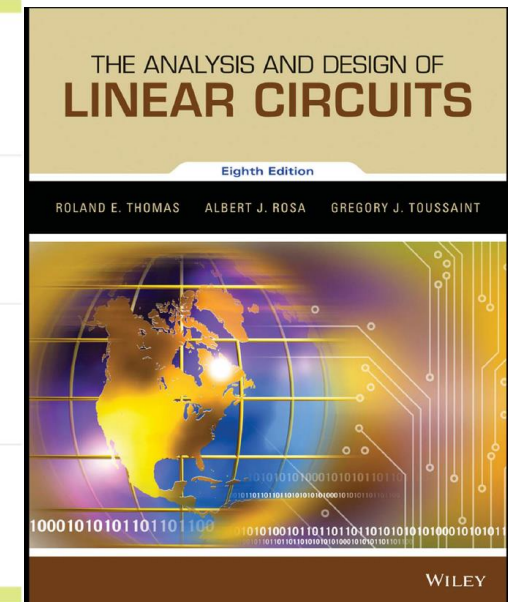
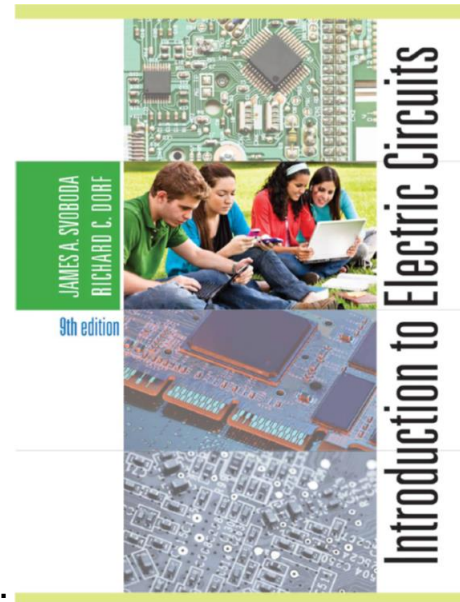
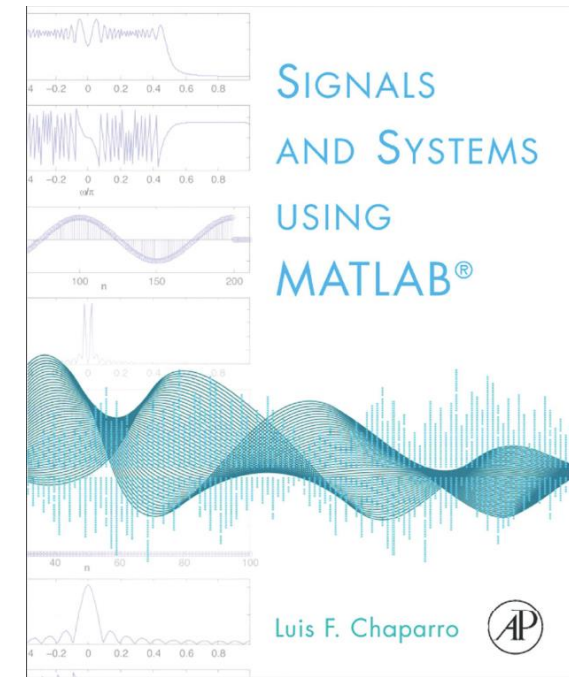
- Mainly learn how to analyze the continuous or discrete LTI systems (**Linear-Time-Invariant**)

- **Text Book**

- Introduction of Electrical Circuits, 9th Ed. **Svoboda** and Dorf, 2014 (国际学生版 ) ISBN 978-1-119-54657-3, WILEY
- The Analysis and Design of Linear Circuits, 8th Edition, Roland E. **Thomas**, Albert J. Rosa, and Gregory J. Toussaint, 2016 John Wiley & Sons, Inc., (ISBN: 978-1-119-23538-5)
- Signals and Systems using MATLAB, Luis F. **Chaparro** ISBN 978-0-12-344716-7, **ELSEVIER**
- Reference : E. Kreyszig, Advanced Engineering Mathematics, 10th ed., Wiley, 2018.

- **Lecture**

- Instructor : Jeungphill Hanne, PhD  
[jeungphill.hanne@scupi.cn](mailto:jeungphill.hanne@scupi.cn)
- Office Hour: Tues.(16:45-17:30)  
@ 3-321A Zone 3, or 412 @New Building
- **TA** : Hanven Liu
- Office Hrs : To be announced.
- **Course Format** : Lecture
- **Course Grading**
- HW+Quiz, 2 Midterm, 1 Final and Attitude etc.



## 2. Course Introduction

### • Course Scope & Objective & Prerequisites

- **Objective** : Understand and Learn how to analyze and characterize the continuous or discrete LTI systems (**Linear-Time-Invariant**), based on the various mathematical methods such "Laplace, or Fourier, Z Transformation", "Sampling" "Probability, or Random Variables" or "Hypothesis or Statistical tests" , while being assisted by "MATLAB" , and apply them to design the LTI Analog or Digital system.

### - Topics or Scope :

- Mathematical modeling of continuous-time signals and systems
- Time-domain and frequency-domain approaches to analysis of continuous-time LTI systems
- Application of the Laplace transform to linear circuits and LTI systems
- Fourier series, Fourier transform, and the frequency response of linear circuits and LTI systems
- Introduction to sampling, reconstruction and aliasing
- Probability, random variables, PDF, computation of moments, conditional random variables and ECE applications
- Hypothesis testing and simple statistical tests
- Design the LTI Analog or Digital system

- **Prerequisites: ECE 0401 ECE Analytical Methods**

### • Course Grading :

- **Grading** : HW+ Quiz (15%), Midterm I (25%), Midterm II (25%), Final (30%) and Attitude(5% : Attendance, Focus, Engagement, Punctuality for HW, etc.)

→ Less than 60% attendance might be failed for the course!

*Can be flexible!*

# Tentative Course Schedule

Week	ECE_0402 (Signals, Systems & Probability)	Topics	Assignment
Week 1 (2/26-3/3)	Introduction	Syllabus & Introduction on the LTI system	
Week 2 (3/4-3/10)	Chap 13 (Svoboda)	Frequency Response	HW1
Week 3 (3/11-3/17)	Chap 14 (Svoboda)	Laplace transformation	
Week 4 (3/18-3/24)	Svoboda, Thomas. Chaparro	Laplace transformation to the Continuous System & Circuit	HW2
Week 5 (3/25-3/31)	Chap 15 (Svoboda)	Fourier transformation	
Week 6 (4/1-4/7)	Svoboda, Thomas. Chaparro	Fourier transformation to the Continuous System & Circuit	HW3
Week 7 (4/8-4/14)	Review & <b>Mid Term 1</b>	Transfer Function for Analog Filters	
Week 8 (4/15-4/21)	Chap 6 (Chaparro)	Application on the continuous system	HW4
Week 9 (4/22-4/28)	Chap 7& 8 (Chaparro)	Discrete system and Sampling, Reconstruction and Aliasing	
Week 10 (4/29-5/5)	Chap 9 (Chaparro)	Z transformation & Circuit	HW5
Week 11 (5/6-5/12)		Z transformation to Discrete System & Circuit	HW6
Week 12 (5/13-5/19)	Chap 10 (Chaparro)	Fourier series	
Week 13 (5/20-5/26)	Review & <b>Mid Term 2</b>	Fourier series to Discrete System & Circuit	HW7
Week 14 (5/27-6/2)	Chap 12 (Chaparro)	Transfer Function for Digital Filters	
Week 15 (6/3-6/9)	Chap 12 (Chaparro)	Application on the discrete system	HW8
Week 16 (6/10-6/16)	Hand-out	Probability, random or conditional random variables, PDF, etc. and ECE applications	HW9
Week 17 (6/17-6/23)	Hand-out	Hypothesis testing & simple statistical tests	HW10
Week 18 (6/24-6/30)	Hand-out	Design for the LTI Analog , or Digital System	HW11
Week 19 (7/1-7/7)	Review & <b>Final</b>		