

# ❖ **2021S-ENGR\_0031: Electric Circuits**

## **Instructor : Jeungphill Hanne**

### ❖ **Syllabus**

#### **1. SCUPI 2021 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 Overview of Chapters**

# 1. SCUPI 2021 Spring Academic Calendar

- Academic Calendar : Midterms & Final etc.

SCUPI Academic Calendar for 2020-2021 Spring																											
	Feb.Mar.			Apr.				May					Jun.				Jul.				Aug.						
<b>Monday</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
<b>Tuesday</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
<b>Wednesday</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
<b>Thursday</b>	25	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>Friday</b>	26	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>Saturday</b>	27	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>Sunday</b>	28	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>SCU Week</b>	0	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
<b>SCU Term</b>	Spring Term																			Intl.wk.		Summer Recess					

**Notes:**  
 Registration: Feb.25-26  
 Make-up exam: Feb.26-28  
 Classes begin: Mar.1  
 Tomb Sweeping Day: Apr.4  
 Dragon Boat Festival: Jun.14  
 International Weeks (Intl.wk.): Jul.5-16

1<sup>st</sup> Midterm

2nd Midterm

Final

*This schedule is preliminary!!*

# 1. SCUPI 2021 spring Academic Calendar

- My Schedule : Office hours etc.

2020-2021 Spring Semester Course Schedule					
Class time	Monday	Tuesday	Wednesday	Thursday	Friday
08:15-09:00			Electric Circuit 01 3-102		
09:10-09:55			Electric Circuit 01 3-102		
10:15-11:00	Physics I 01 3-101		Electric Circuit 01 3-102		Physics I 02 3-101
11:10-11:55	Physics I 01 3-101		Office Hour Electric Circuit 01		Physics I 02 3-101
Lunch Break					
13:50-14:35		Physics I 02 3-101	Physics I 01 3-101	Electric Circuit 02 3-103	
14:45-15:30		Physics I 02 3-101	Physics I 01 3-101	Electric Circuit 02 3-103	
15:40-16:25		Office Hour Physics 1 02	Office Hour Physics 1 01	Electric Circuit 02 3-103	
16:45-17:30				Office Hour Electric Circuit 02	
17:40-18:25					

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

# 2. Course Introduction

## • Course information

### • Electric Circuits

- Learn the basics of Electric Circuit, and the systematic approaches in obtaining and designing the Circuit properties

### • Text Book

- Introduction of Electrical Circuits, 9th Ed. Svoboda and Dorf, 2014 (国际学生版)
- ISBN 978-1-119-54657-3, **WILEY**

### • Lecture

- Instructor : Jeungphill Hanne, PhD  
[jeungphill.hanne@scupi.cn](mailto:jeungphill.hanne@scupi.cn)
- Time : Wed.(08:15-11:00),or Thur. (13:50-16:25)
- Office Hour : Wed.(11:10-11:55)/ Thur.(16:45-17:30)
- Office : 3-321A @ Zone 3

### • TA : Tories, and Tonya

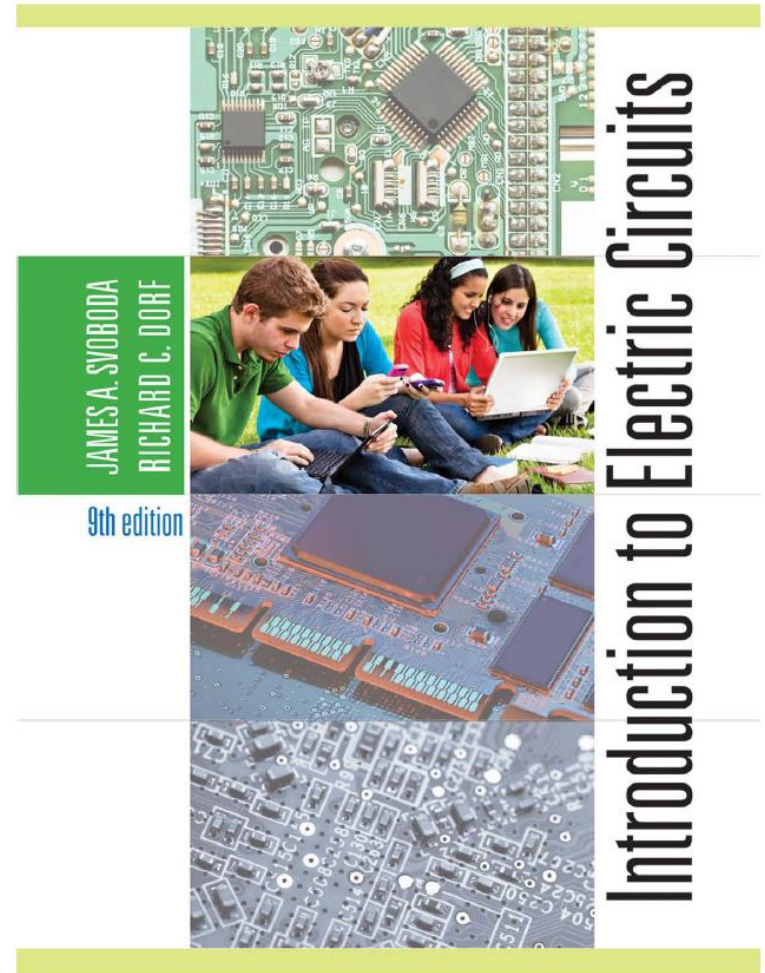
- Office Hrs : To be announced.

### • Course Format

- Lecture, and Active Participation ( i.e. Quiz, **Quiz Presentation**, etc.)

### • Course Grading

- Two Midterms, Final, Homework, Quiz, and Attitude (ex. Attendance, Engagement, Punctuality for HW, etc.)



## 2. Course Introduction

### • Course Scope & Objective

- Objective : Understand the basic Electric Circuits, Systematically Solving Electrical properties and eventually obtaining an ability to design a simple Electric Circuit.
- Scope : An advanced Course based on “Electricity & Magnetism” of the Physics 2 course
  - Required : **Basic Concepts** (the Physics 2 course) + **Some mathematical approaches!**
  - 1. Steady State Circuit : Constant Sources (Voltage, Current), Resistors, Op Amp
    - Chap 1 ~ Chap 6 : **Not much for Math ! (Just simple Matrices)**
  - 2. Time dependent Circuit : 1+ Variable Sources (Voltage, Current), Capacitors, Inductors
    - Chap 7 ~ Chap 13 : **1<sup>st</sup>, 2<sup>nd</sup> Order Differential Eq.. Frequency Domain Analysis (AC)**
  - 3. A Mathematical tool to tackle **Differential Equation**
    - Chap 14 ~ Chap 16 : **Mathematical Transformation(Laplace, Fourier)**

### • Course Learning Key Points

- **Systematically and Mathematically Formularize Concepts and Results of Electric Circuit**
  - Can Assist to solve to Electrical Properties Easily and Quickly, and to design a New Circuit!  
(So, Assume Concepts and Results are already familiarized!!, and Also Some Math!

### • Course Grading

- Grading Components : HW(15%), Quiz (10%), Midterm I (23%), Midterm II (23%), Final (24%) and Attitude(5% : Attendance, Engagement, Punctuality for HW, etc.)

*Can be Flexible!*

*Tests are not accumulative, but might overlap a little bit !*

## • Tentative Course Schedule

Week	ENGR_0031(Electric Circuits)	Topics	Assignment
Week 1 (3/8-3/12)	Introduction & Chap 1	<b>Syllabus</b>	
Week 2 (3/15-3/19)	Chap1 & Chap 2	<b>Electric Circuit Variables</b>	HW1
Week 3 (3/22-3/26)	Chap2 & Chap 3	<b>Circuit Elements</b>	HW2
Week 4 (3/29-4/02)	Chap 3 & Chap 4	<b>Resistive Circuits</b>	HW3
Week 5 (4/05-4/09)	Chap 4	<b>Analysis of Resistive Circuits</b>	
Week 6 (4/12-4/16)	Chap 4 & <b>Mid Term 1</b>		HW4
Week 7 (4/19-4/23)	Chap 5	<b>Circuit Theorems</b>	
Week 8 (4/26-4/30)	Chap 5 & Chap 6	<b>The Operational Amplifier</b>	HW5
Week 9 (5/03-5/07)	Chap 6		HW6
Week 10 (5/10-5/14)	Chap 7	<b>Energy Storage Elements</b>	HW7
Week 11 (5/17-5/21)	Chap 8	<b>RL and RC Circuits</b>	
Week 12 (5/24-5/28)	Chap 8		HW8
Week 13 (5/31-6/04)	Review & <b>Mid Term 2</b>		
Week 14 (6/07-6/11)	Chap 9	<b>RLC Circuits</b>	
Week 15 (6/14-6/18)	Chap 9		HW9
Week 16 (6/21-6/25)	Chap 10	<b>Sinusoidal Steady-State Analysis</b>	HW10
Week 17 (6/28-7/02)	Chap 10		HW10
Week 18 (7/05-7/09)	<b>Final week</b>		

### 3. Brief Overview of Chapters and Chapter 1

- Brief Overview of Chapters
- Course Learning Key Points
- Chap 1

Where KVL & KCL come from ?

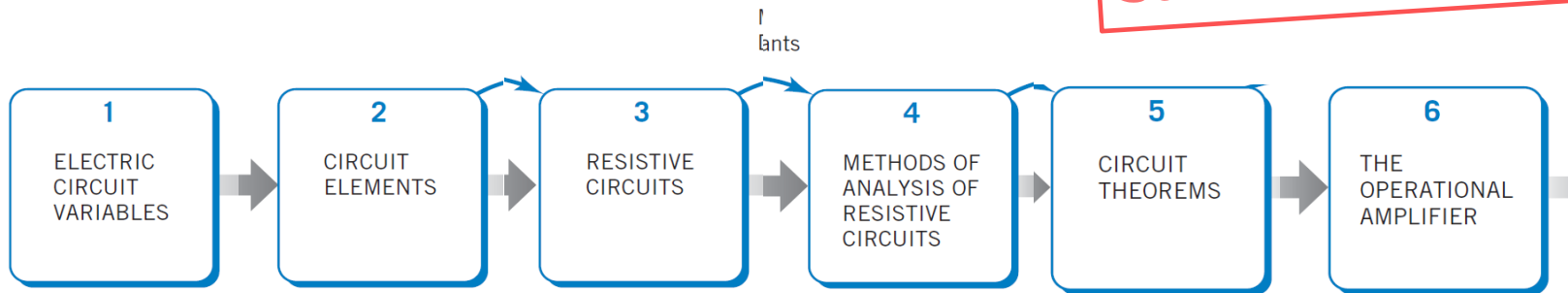
#### • Brief Overview of Chapters

- ✓ All Chapters : Mainly Categorized to Three Parts!

Most Important Part !

#### 1). First Part : Steady State of “Simple” Circuit

Saturated State !



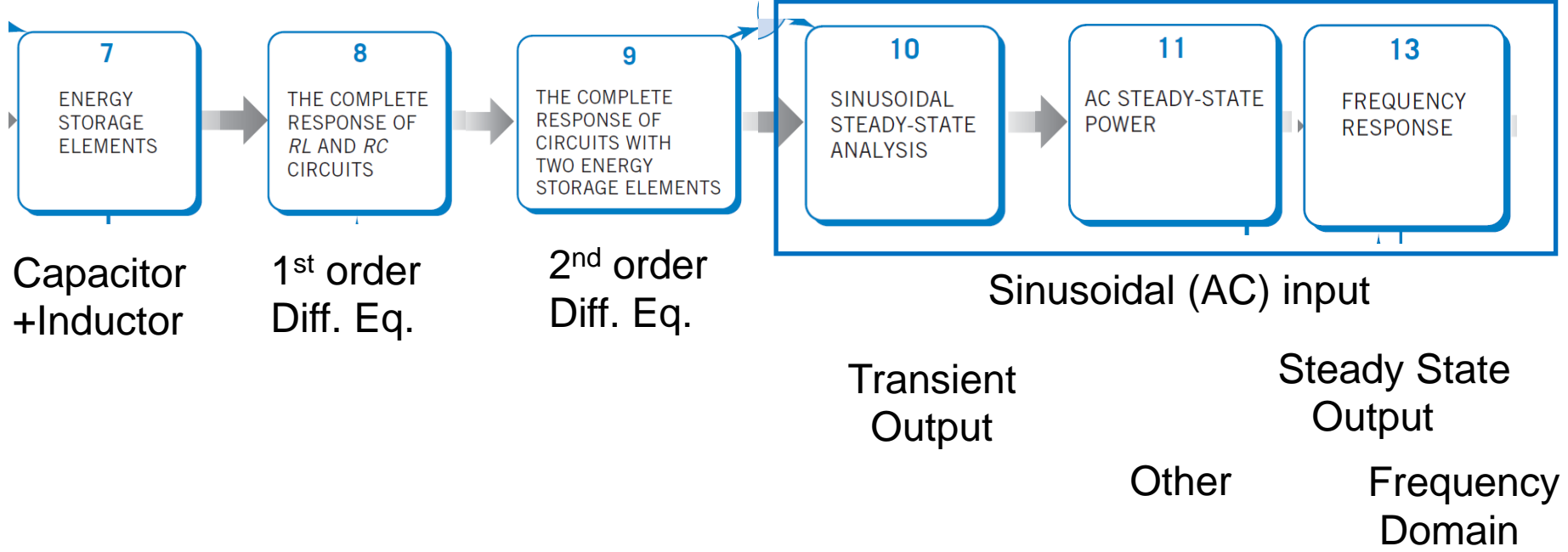
- Circuit Elements : **Resistor Only**, Constant Energy Source (Voltage, Current)
- **Kirchhoff Voltage Law(KVL) & Kirchhoff Current Law(KCL)**
- Theorems from KVL & KCL → Formularize them
- New Electric Component : Op Amp (Operational Amplifier) for Mathematical Calculation  
→ Not really Mathematically New!!

Just KVL & KCL!

# 3. Brief Overview of Chapters and Chapter 1

## 2). Second Part : Time Varying Circuit

2<sup>nd</sup> Most Important Part !

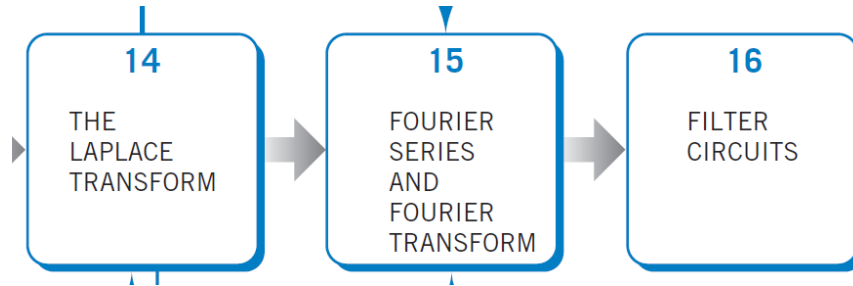


- Circuit Elements : **Resistor + Capacitor + Inductor Only**, Time Varying Energy Source  
[Specially Alternating → Sinusoidal : AC(Alternating Current )]
- **Kirchhoff Voltage Law(KVL) & Kirchhoff Current Law(KCL)**  
→ Mathematics : 1<sup>st</sup> order, 2<sup>nd</sup> order differential equation, and Frequency Domain Analysis (AC)



# 3. Brief Overview of Chapters and Chapter 1

## 3). Third Part : Useful Mathematical Tools for Diff. eq. (Solving, Analysis)



Transient+ Steady Frequency  
State Output Analysis

It is good to know !

### • Course Learning Key Points

Revisiting!

- **Systematically and Mathematically Formularize Concepts and Results of Electric Circuit**  
→ Can Assist to solve to Electrical Properties Easily and Quickly, and to design a New Circuit!  
(So, Assume Concepts and Results are already familiarized!!, and Also Some Math!