



<b>Module Title</b> Electronic Circuits	<b>Module Code</b> MSDE 240	<b>Semester (Sem 1 / Sem 2)</b> Sem 2
<b>Credits</b> 10	<b>Level</b> 4	<b>Professor and email</b> Dongha SHIM dongha@seoultech.ac.kr
<b>Delivery Method</b> Lecture / Lab	<b>Delivery Location</b> SeoulTech, Mugung Hall	

### Module Synopsis

This module provides students with knowledge for the analysis and design of electronic devices and circuits. The module mainly focuses on elementary electronic circuit building blocks including amplifiers, filters, AC-DC, ADC/DAC and switches, using components including: operational amplifiers, diode circuits, transistor amplifiers, and basic digital logic. Hands-on labs and computer-aided analyses for various electronic circuits enhance the students' understanding of the topics.

The module will be delivered via a combination of lectures, labs, and directed and independent learning. Assessment consists of labs and a final examination. The student will receive formative feedback throughout the lectures and labs.

### Outline Syllabus

#### Network frequency characteristics

Sinusoidal frequency analysis. Passive filter networks. Resonant circuits.

#### Operational amplifiers

The ideal OP amp. The inverting amplifier. The summing circuits. The integrator.

#### Semiconductors, diodes, and transistors

p- and n-type semiconductors. Current conduction in semiconductors. p-n junction diode. Diode circuit models. The Zener diode. MOSFET fundamentals. MOSFET/BJT characteristic curves and regions of operation.

#### Transistor amplifiers

Simple MOSFET and BJT amplifier circuits-small signal analysis.

#### Basic Digital Logic Design

Basic logic gates and sequential logic design using D-Type flip flops



### Indicative Reading

- 1) G. Rizzoni, Principles and Applications of Electrical Engineering, 5th Ed., McGraw-Hill, 2005, ISBN 0073220337.
- 2) D. V. Kerns Jr. and J. D. Irwin, Essentials of Electrical and Computer Engineering, 2nd Ed., Prentice Hall, 2004, ISBN 0139239707.

NOTIONAL STUDENT WORKLOAD	Hours
MODE OF DELIVERY (FT / PT / DL)	FT
Lectures	40
Seminars	
Tutorials	
Laboratories/studios/practical	20
Directed learning	
Independent Learning	40
Work experience/fieldwork	
Other: eg formal presentation	0
Total Workload 100 hours for a 10 credit module 200 hours for a 20 credit module	100

### Module Outcomes

KU1,2,3	KU1. Demonstrate basic knowledge of the scientific and mathematical foundations of engineering to solve basic problems. KU2. Perform simple analysis of familiar engineering systems. KU3. Identify and utilise basic methodologies to create solutions to specific engineering problems.
IPSA1,4	IPSA1. Demonstrate the use of fundamental approaches to solving readily defined engineering problems. IPSA4. Illustrate solutions to basic engineering problems.
PVA2	PAV2. Demonstrate creativity in discussing solutions to standard problems.



Seoul National University of  
Science & Technology  
232 Gongneung-ro, Nowon-gu,  
Seoul 01811 Korea

## MSDE Module Descriptor

<b>Assessments</b>	<b>Assessment Type</b>	<b>Weighting %</b>	<b>Midterm/interim/final</b>
Coursework			
Project			
Quiz			
Test			
Laboratory	Group report	30	Lab
Exam	Final formal examination	70	Final
Presentation			