JOINT INSTITUTE
交大密西根学院

Standard Undergraduate Course Profile

COURSE NUMBER: Ve215	**COURSE TITLE: Introduction to Circuits**
CREDIT: 4	**PREREQUISITES:** VV156 or VV186, VG101, Co-requisite VP240 (or VP260)
TEXTBOOKS/REQUIRED MATERIAL: Fundamentals of Electric Circuits, 5/e, by Charles K. Alexander and Matthew N. O. Sadiku, McGraw Hill, 2013, ISBN 978-0-07-338057-5	**PREPARED BY:** Sung-Liang Chen **LAST UPDATED:** October 22, 2020 **DATE OF DISCIPLINE GROUP APPROVAL:** **DATE OF UC APPROVAL:**
CATALOG DESCRIPTION (No more than 100 words): This course is designed to cover basic concepts of circuits. Specifically, students will learn how to analyze the circuits. Also, there are 8 labs, which helps students gain hands-on experience of circuits.	**COURSE TOPICS:** Basic concepts of voltage and current; Kirchhoff's voltage and current laws; Ohm's law; voltage and current sources; Thevenin and Norton equivalent circuits; DC and low active circuits using operational amplifiers; energy and power. Time- and frequency-domain analysis of RLC circuits. Basic passive and active electronic filters. Laboratory experience with electrical signals and circuits.

COURSE STRUCTURE and CONTACT HOUR: 48 hours of Lecture/ 36 hours of Lab/ 4 hours of recitation classes

COURSE OUTCOMES [Student Outcomes* in brackets] *for each course outcome, links to the Student Outcomes are identified in brackets.*	(The following is an example. Please delete it when you compose your own document.) 1. Understand the basic concepts of voltage and current. [1] 2. Understand the concept of voltage and current sources. [1, 2] 3. Be able to use Ohm's law, Kirchhoff's voltage and current laws. [1, 2] 4. Be able to apply Thevenin and Norton equivalent circuits. [1, 2] 5. Be able to analyze the circuits with operational amplifiers. [1, 2] 6. Understand the concepts of energy and power in circuits. [1, 2] 7. Be able to conduct time- and frequency-domain analysis of circuits. [1, 2, 7] 8. Understand basic passive and active electronic filters. [1, 2, 7] 9. Be able to conduct basic experiments related to electrical signals and circuits. [6]
COURSE OBJECTIVES [Course Outcomes in brackets] *for each course objective, links to the course outcomes are identified in brackets.*	(The following is an example. Please delete it when you compose your own document.) 1. To teach students basic concepts of voltage and current. [1, 2] 2. To teach students basic laws of circuits. [3, 4] 3. To teach students how operational amplifiers work. [5] 4. To teach students about the basic concepts of energy and power in circuits. [6] 5. To teach students the AC circuit analysis. [7, 8] 6. To provide students lab experience. [9]
ASSESSMENT TOOLS [Course Outcomes in brackets] *for each assessment tool, links to the course outcomes are identified*	(The following is an example. Please delete it when you compose your own document.) 1. Homework 10% [1-9] 2. In-class quizzes 10% [1-9] 3. Labs 15% [9] 4. Midterm exam [1-4] 5. Final exam [4, 5]

ABET Student Outcomes* —— Apply to Engineering, Math, and Science Courses Only

1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

3) an ability to communicate effectively with a range of audiences

4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies