Course Code	TKEE161104
Course Name	Fundamental of Electrical Engineering
Course Instructors	Bondhan Winduratna, Eka Firmansyah, Suharyanto, Priyatmadi, Harry Prabowo
Course Type	Required
Course Classification	Engineering Topics
Credit / Contact Hour per Week	3 / 150 minutes per Week
Course Description	Understanding of basic theory of electrical engineering, such as Ohm's Law, Kirrchoff's Law, Thevenin, and Norton, also first and second order of differential equation model from an electric circuit. Analyze RLC circuit for DC and AC under transient and steady state. Determination of frequency response (amplitude and phase), resonancy and phasor analysis in AC circuit.
Prerequisites Courses	Physics for Electrical Engineering (TKIE161102)
Covered Student Outcome	**Fundamental and Engineering Knowledge (a)**

Learning Outcome	1. Students are able to explain fundamental laws in electrical engineering, and how resistor, inductor and capacitor work 2. Students are able to model the electric circuit using first and second order differential eqiations. 3. Students are able to analyze electric circuit to determine nature response (transient) and forced (steady state) from DC or AC electric circuit. Analysis of phasor quantity in AC circuit. 4. Students are able to determine frequency response (amplitude and phase), the nature of frequency-based filters and resonance phenomena from an electric circuit.
Topic	1. Repeating the electric and magnetic quantities. Discuss about complex number and ordinary differential equation with constant coefficient. 2. Basic idea of electric circuit, Ohm's Law, Kirrchoff's Law, Thevenin, Norton and superposition principle. 3. Wave and it is representation : Complex exponential, sine wave and RMS value. 4. Electric circuit modeling using differential equation. 5. Nature response (transient), forced response (steady state), and complete response for DC and AC circuit. 6. Analysis of phasor quantity in AC circuit. 7. Frequency response which covers amplitude and phase response. The nature of electric circuit as a LPF, HPF, BPF, NF filters and resonance condition.
Direct Asessment	
Indirect Assesment	Questionnaire (EDOM)
References	[1] Smith, Ralph J., 1984, Circuits, Devices, and Systems, John Willy & Sons, United States [2] Theraja, B. L. and Theraja, A. K., 1999, A Textbook of Electrical Technology in SI Units. Volume I: Basic Electrical Engineering. S Chand & Co Ltd

Direct Asessment Plan	**Measured Learning Outcome**
Engineering Design Assignment – Creating Proof of Concept	LO2, LO4
Engineering Design Assignment – Presenting the solution	LO3
Mid Exam	LO1, LO4
Final Exam	LO1, LO2