Course Code	TKEE163113
Course Name	Power System Equipment
Course Instructors	Harnoko, Bambang Sugiyantoro
Course Type	Selected Elective
Course Classification	Engineering Topics
Credit / Contact Hour per Week	2 / 100 minutes per Week
Course Description	This course studies the various main equipments and auxiliary equipments in the power system. Lecture materials for power system equipment: Introduction, fuse, recloser / PBO, sectionalizer / SSO, disconnecting-switch / DS / PMS, switch breaker / CB / PMT, load switch, arrester, absorber-surge, grounding, isolator, bushing, power transformer, current transformer, voltage transformer, automatic voltage regulator / AVR, capacitor, inductor, resistor, busbar and protection relay. This course is given in semester 5 and is mandatory for students of Electrical System Study Program. Prerequisite subject does not exist. Some learning materials are given in the form of lectures and discussions. The examples given will always be adapted to the development of science and technology.
Prerequisites Courses	
Covered Student Outcome	**Modern Tools Utilization (e)**

Learning Outcome	1. Students are able to can describe the symbol / symbol of the electrical system equipment, can choose and determine the proper rating with technical calculations for Fuses, Recloser / PBO, Sectionalizer / SSO, and their coordination. 2. Students are able to choose and determine the rating of Disconnecting-Switch / DS / PMS, Circuit Breaker / CB / PMT, Arrester, Isolator and Bushing, can explain how to work / operation. 3. Students are able to explain the AVR operations, select and define their ratings, can explain the operation and determine the settings of various safety releases. 4. Students are able to determine a grounding system that meets the standards.
Topic	1. An overview of power delivery systems from power plants to consumers. Classification of stresses in electrical power systems and knowing the equipment / equipment in the electric power system 2. Working principle, selection, size determination and fuse placement and coordination. 3. Working principle, selection, determination and placement of recloser / PBO and its coordination. 4. Working principle, selection, size determination and sectionalizer / SSO placement and coordination. 5. Working principle, selection, determination and placement of disconnecting switch / DS / PMS and other switches. 6. Working principle, selection, determination and placement of circuit breaker / CB / PMT 7. Working principle, selection, determination and placement of arresters and surge absorber. 8. Cooling system and parallel operation of 3 phase power transformer (clock figure transformer). 9. Selection, determination of the size and use of current transformer and voltage transformer. 10. Working principle, selection, determination and use of AVR (automatic voltage regulator). 11. Working principle, selection, determination and use of isolator and bushing. 12. Selection, determination and use of capacitors, inductors and resistors. 13. Working principle, selection and use of safety relay. 14. Selection and determination of the size of the earthing system.
Direct Asessment	**Direct Asessment Plan** | **Measured Learning Outcome**

	Assignments	LO1,LO3
	Mid Exam	LO1,LO2
	Final Exam	LO1,LO3,LO4
Indirect Assesment	Questionnaire (EDOM)	
References	[1] ABB, 1995, Switchgear Manual, Switzerland. [2] Horrowits, 1989, Power System Protection, John Wiley and Sons, New York [3] Pansini, 1989, Basic Electrical Power System Equipment, McGraw-Hill, New York [4] Ravindranath, 1982, Power System Protection and Switchgear, Tata McGraw-Hill, New Delhi [5] Tobing, Bongas, 2007, Peralatan Tegangan Tinggi, Erlangga, Jakarta. [6] Internet : http://papirus2/te.ugm.ac.id	