

Course Code	TKEE163115
Course Name	High Voltage Techniques
Course Instructors	Suharyanto
Course Type	Selected Elective
Course Classification	Engineering Topics
Credit / Contact Hour per Week	2 / 100 minutes per Week
Course Description	In the electrical system many used isolation which is useful for separating the parts of the tension from the non-holding part. This insulating material must be tested for its durability to maintain a certain voltage. While this insulation material will experience a decrease in quality in its application. To know the characteristics of an insulating material should be tested by applying the appropriate voltage whether the DC voltage, AC voltage, or impulse voltage.
Prerequisites Courses	
Covered Student Outcome	<b>Development of Engineering Solution (b) Engineering Design (c)</b>
Learning Outcome	<ol style="list-style-type: none"> <li>1. Students are able to know that the most important tool in testing by using high voltage is a high voltage transformer. Therefore here introduced high voltage transformer and the difference with power transformer.</li> <li>2. Students are able to assemble the components needed to make the tension plant high impulse and electrostatic</li> <li>3. Students are able to know that the electric field distribution needs to be studied also on the isolation consisting of multi dielectrics in order to know the weakest parts or the parts that the electric field lines collect much in the area. The hope can be designed form of multi dielecttic insulator which its homogeneous electric field distribution. For this it would be better to calculate the electric field by numerical method as well.</li> <li>4. Students are able to know that gas insulation is widely used in high voltage equipment. Therefore it is necessary to know the various properties of gas insulation and phenomena that occur up to the phenomenon that caused the failure of this gas insulation. This includes the effect of a non-uniform electric field, which may be influenced by the electrodes used.</li> <li>5. Students are able to know that other kinds of insulating materials other than gases are solid insulating materials and liquid insulating materials. Both sorts of insulation material will fail in any particular condition. These characteristics by the student need to be known in order to avoid the failure of the insulation materials.</li> <li>6. Students are able to know that the resistance of insulation materials in holding high voltage has various values depending on the type of insulation material. On the other hand there is a tool whose function is to protect the insulating material so that the insulating material is not damaged when there is more voltage that tends to damage it. This protective device when there is more voltage must be operated before the voltage is more felt by the insulating material it protects. It is in this context that between the insulating material which needs protection and the protective device must have good isolation coordination, so that the insulating material does not become damaged when there is a more threatening voltage.</li> </ol>
Topic	<ol style="list-style-type: none"> <li>1. Preliminary :</li> <li>2. High Voltage on Electric Power System</li> <li>3. High Voltage Upside-Down and Unidirectional</li> <li>4. High Voltage Impuls Generation</li> </ol>

	<ol style="list-style-type: none"> <li>5. High Voltage Measurements</li> <li>6. Control of Electrical and Electrostatic Field Pressure</li> <li>7. Control of Electrical and Electrostatic Field Pressure</li> <li>8. Failure of Gas Insulation</li> <li>9. Failure of Solid and Liquid Isolation</li> <li>10. Testing Not Destructive on Isolation</li> <li>11. More Voltage</li> <li>12. Isolation Coordination</li> <li>13. External Isolator Design and Testing</li> </ol>										
Direct Asessment	<table border="1"> <thead> <tr> <th>Direct Asessment Plan</th> <th>Measured Learning Outcome</th> </tr> </thead> <tbody> <tr> <td>Assignments</td> <td>LO1, LO4</td> </tr> <tr> <td>Mid Exam</td> <td>LO1,LO2,LO3</td> </tr> <tr> <td>Final Exam</td> <td>LO4,LO5,LO6</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	Direct Asessment Plan	Measured Learning Outcome	Assignments	LO1, LO4	Mid Exam	LO1,LO2,LO3	Final Exam	LO4,LO5,LO6		
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Indirect Assesment	Questionnaire (EDOM)										
References	<ol style="list-style-type: none"> <li>[1] Aris Munandar, Teknik Tegangan Tinggi, 2001.</li> <li>[2] Haddad, D.Warne, Advances in High Voltage Engineering, 2001.</li> <li>[3] Andrew R..Hileman, Insulation Coordination, Marcel Dekker, Inc, 1999</li> <li>[4] Kueffl, High Voltage Engineering, 2<sup>nd</sup> Edition, Newnes Inc., 2000, Oxford.</li> <li>[5] Mazen agdel 'sala, Marcel Decker, High Voltage Engineering, Theory and Aplicaation</li> </ol>										