



MODULE HANDBOOK DESCRIPTION

Module designation	<i>Power Systems Protection</i>	
Code	<i>FBA4115</i>	
Semester(s) in which the module is taught	<i>7/fourth year</i>	
Person responsible for the module	<i>Supriyatna, S.T., M.T.</i>	
Language	<i>Indonesian</i>	
Relation to curriculum	<i>Compulsory on power system expertise</i>	
Teaching methods	<i>lectures, small group discussion, case base method, team project-based method</i>	
Workload (incl. contact hours, self-study hours)	<p>Contact minutes every week, each week of the 16 weeks/semester:</p> <ul style="list-style-type: none"> • Lectures: 2 x 50 minutes. • Exercises and assignments: 2 x 60 minutes. • Self-learning: 2 x 60 minutes. <p>total study hours = 5 hours 40 minutes/week</p>	
Credit points	<i>2 SKS (~ 3,2 ECTS)</i>	
Required and recommended prerequisites for joining the module	<i>Power System Analysis I (FBA3101)</i> <i>Power System Analysis II (FBA3208)</i>	
Module objectives/intended learning outcomes	<i>1. Students are able to analyze the basic protection systems and types of disturbance in the electric power system</i>	<i>PLO3</i>
	<i>2. Students are able to design the best performance of CT and PT</i>	<i>PLO4</i>
	<i>3. Students are able to analyze the types, function and working principles of protection relays</i>	<i>PLO3</i>
	<i>4. Students are able to design of OCR coordination</i>	<i>PLO4</i>
	<i>5. Students are able to analyze differential relays</i>	<i>PLO3</i>
	<i>6. Students are able to design distance relays</i>	<i>PLO4</i>
	<i>7. Students are able to analyze directional relays</i>	<i>PLO4</i>

	8. <i>Students are able to simulate protection systems at transformer</i>	<i>PLO5</i>
	9. <i>Students are able to simulate protection system on electric motor and generator</i>	<i>PLO5</i>
Content	<ol style="list-style-type: none"> 1. <i>Introduction of power systems protection</i> 2. <i>Instrument transformations (CT and PT)</i> 3. <i>Relay protection</i> 4. <i>Overcurrent relay (OCR)</i> 5. <i>Differential relay</i> 6. <i>Distance relay</i> 7. <i>Direction relay</i> 8. <i>Transformer protection</i> 9. <i>Generator and motor protection</i> 	
Examination forms	<ul style="list-style-type: none"> - <i>Written case study</i> - <i>Written and oral project study</i> - <i>Essay midterm and final test</i> 	
Study and examination requirements	<p><i>The final grade in the module is composed of</i></p> <ol style="list-style-type: none"> a. <i>Case I assessment: 10 %</i> b. <i>Case II assessment: 15 %</i> c. <i>Team-Project assessment: 35 %</i> d. <i>Written Midterm assessment: 15%</i> e. <i>Written Final assessment: 25%</i> <p><i>Students must have a final grade of 65% or higher to pass</i></p>	
Reading list	<ol style="list-style-type: none"> 1. <i>Walter A. Elmore, edited, 1994, Protective Relaying Theory and Applications, ABB- Marcel Dekker</i> 2. <i>Anderson, P. M., 2001, Power System Protection, IEEE Press,</i> 3. <i>Protective Relays Application Guide, 1975, The General Electric Company (GEC)</i> 4. <i>J. Lewis Blackburn, 1998, Protective Relaying, Principles and Applications, second edition, Marcel Dekker.</i> 	