



**MODULE HANDBOOK DESCRIPTION**

Module designation	Power Systems Operation Management	
Code	FBA4114	
Semester(s) in which the module is taught	7 / fourth year	
Person responsible for the module	I Made Ari Nrartha, S.T., M.T.	
Language	Indonesian	
Relation to curriculum	Elective for Electrical Power System Engineering	
Teaching methods	Lectures, Discovery Learning, Small Group Discussion, and Project Based Learning.	
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"> <li>• Lectures: 2 x 50 minutes</li> <li>• Exercises and Assignments: 2 x 60 minutes</li> <li>• Self-study: 2 x 60 minutes.</li> </ul> <p>Total study hours = 5 hours 40 minutes/week</p>	
Credit points	2 SKS (~ 3,2 ECTS)	
Required and recommended prerequisites for joining the module	- Power System Analysis I (FBA3101)	
Module objectives/intended learning outcomes	1. Students are able to analyze the structure and operating conditions of the electric power system, control methods in power system operation, the operating quality of electric power systems, and the economics of operation.	PLO3
	2. Students are able to categorize safe operation of electric power systems for the purpose of maximum protection and can design quality, safe, and economical operating systems.	PLO4

	3. Students can create simulation projects using the MATLAB program to assess the quality of the operation of the system under study (voltage and frequency meet standards), as well as its safety and economy.	PL05
Content	The components of the electric power system, the basic requirements of the operation of the electric power system, the operating conditions of the electric power system, the hierarchical structure of the electric power system, controls on the operation of the power system, active power and frequency control, voltage and reactive power control, operation continuity electric power system, electric power quality and standards, switching safety, steady state safety, power system contingency analysis, automatic generation control (AGC), heat rate curve and cost rate curve, economic dispatch (ED) on power system operation, load frequency control (LFC), ED and LFC coordination, short term load forecasting, unit commitment.	
Examination forms	<ul style="list-style-type: none"> <li>- Homework,</li> <li>- Written case study,</li> <li>- Présentation case study,</li> <li>- Midterm and final test.</li> </ul>	
Study and examination requirements	<p>The final grade in the module is composed of:</p> <ul style="list-style-type: none"> <li>a. Exercise Report/ Homework/Portofolio: 15%</li> <li>b. Projects: 55%</li> <li>c. Midterm assessment: 15%</li> <li>d. Final assessment: 15%</li> </ul> <p>Students must have a final grade of 65% or higher to pass</p>	

Reading list	<ol style="list-style-type: none"><li>1. Nrrartha, I.M.A., Ginarsa, I.M., Muljono, A.B., 2018, Buku Ajar Manajemen Operasi Sistem Tenaga Listrik, Cetakan Pertama, Mataram University Press, Mataram.</li><li>2. Kirchmayer, L.K., 2009, "Economic Operation of Power Systems", John Wiley &amp; Sons, Inc., New York.</li><li>3. IEC, 2009, "IEC standard frequencies", ISBN 978-2-88910-067-5.</li><li>4. IEEE-CIGRE Joint Task Force on Stability Terms and Definitions, 2004, "Definition and Classification of Power System Stability", IEEE Transactions on Power Systems.</li><li>5. Beng, G., H., dan Tjing L., T., 1995, "PT. PLN In-House Training Course On Energy Management Systems", PT. PLN (Persero) &amp; Nanyang Technological University Singapore.</li><li>6. SPLN no 1., 1995, "Tegangan-Tegangan Standar", PLN, Jakarta.</li><li>7. Articles from the journals of the last 5 years on the operation management of electric power systems.</li></ol>
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