MODULE HANDBOOK DESCRIPTION

Module designation	Optimization of Modern EPS	
Code	FBA0012	
Semester(s) in which the module is taught	7 / fourth year	
Person responsible for the module	I Made Ari Nrartha, ST., MT.	
Language	Indonesian.	
Relation to curriculum	Free elective for Electrical Power System Engineering	
Teaching methods	Lectures, small group discussion, case base method.	
Workload (incl. contact hours, self-study hours)	Contact minutes every week, each week of the 16 weeks/semester: • Lectures: 2 x 50 minutes • Exercises and Assignments: 2 x 60 minutes • Private study: 2 x 60 minutes. Total study hours = 5 hours 40 minutes/week	
Credit points	2 SKS (~ 3.2 ECTS)	
Required and recommended prerequisites for joining the module	- Power Systems Operation Management (FBA4114)	
Module objectives/intended learning outcomes	1. Students are able to select and apply conventional optimization methods and intelligence techniques to quantitatively analyze power system operating performance to increase efficiency and be more economical.	PLO3
	2. Students are able to design electric power system operations for optimization purposes to make the system more efficient and economical.	PLO4

	3. Students are able to recognize needs and have the ability to be involved in lifelong independent learning, especially in achieving an increase in the quality of life with optimization techniques.	PLO9
Content	1. Review of Electrical Power System Operations Management, 2. Parametric Optimization, 3. Unconstrained Optimization, 4. Quasi-Newton Implementation, 5. Least Square Optimization, 6. Nonlinear Least Square Implementation, 7. Constrain Optimization, 8. SQP Implementation, 9. Multiobjective Optimization, 10. Heuristic optimization techniques: immune algorithm, ant colony algorithm, particle swarm optimization, genetic algorithm, fuzzy logic, tabu search and grey wolf optimization.	
Examination forms	- Assignment - Written case study - Midterm and final test	
Study and examination requirements	The final grade in the module is composed of: 1. Assignment : 10 % 2. Case I assessment: 15% 3. Case II assessment: 15% 4. Midterm assessment: 30% 5. Final assessment: 30% Students must have a final grade of 65% or higher to pass	
Reading list	1. Nrartha, I.M.A, Ginarsa, I M, dan Muljono, A.B, 2018, "Buku Ajar Manajemen Operasi Sistem Tenaga Listrik", Universitas Mataram Press, Mataram. 2. Marsudi, D., 1990, "Operasi Sistem Tenaga Listrik", Bhumi Srengseng Indah, Jakarta. 3. Colemen, T., Branch, M.A, and Grace, A., 1999, "Optimization Toolbox for Use with MATLAB, The MATH Works Inc. 4. Berlianty, I., dan Arifin M., 2010, "Teknik-Teknik Optimasi Heuristik", Graha Ilmu, Yogyakarta.	