MODULE HANDBOOK DESCRIPTION

Module designation	Power System Analysis I	
Code	FBA3101	
Semester(s) in which the module is taught	5 / third 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 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 • Self-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	- Basic Programming (FBS1215) - Electrical Circuit I (FBS1213) - Electrical Circuit II (FBS2122) - Numerical Method (FBS2230)	
Module objectives/intended learning outcomes	1. Students are able to analyze the basic concepts of power flow in electrical power systems, using the per unit system to solve power flow calculations, network admittance, power flow in transmission systems, and symmetric components for power flow studies in distribution systems.	PLO3
	2. Students are able to create network impedances from power system networks to solve transmission power flows and create impedance networks based on symmetric components to solve power flows in distribution systems.	PLO4

	3. Students are able to solve power flow studies in transmission and distribution systems using computer simulations.	PLO5
Content	One and two subscript notations, single-phase system power, three-phase system power, change in quantity per unit, unit per unit transformer, unit per unit transmission/distribution line, internal impedance diagram per unit, branch and node admittances, branch coupling magnetic field on Ybus, equivalent admittance network, modification of Ybus, incident matrix of Ybus network, Ybus calculation for short transmission lines and pi models, Gaussian elimination method, synthesis of asymmetric phasors from symmetrical components, symmetrical components of asymmetrical phasors, symmetrical components of star circuits and delta, power in terms of symmetrical components, networks of symmetrical transmission lines, transmission system power flows, and distribution system power flows.	
Examination forms	- Homework, - Written case study, - Présentation case study, - Midterm and final test.	
Study and examination requirements	The final grade in the module is composed of: a. Exercise Report/ Homework/Portofolio: 15% b. Case assessment I: 15% c. Case assessment II: 15% d. Case assessment III: 25% e. Midterm assessment: 15% f. Final assessment: 15% Students must have a final grade of 65% or higher to pass	
Reading list	1. Nrartha, I. M., A., 2020, “Buku Ajar Analisa Sistem Tenaga I”, buku ajar, Jurusan Teknik Elektro, Fakultas Teknik, Universitas Mataram. 2. Nrartha, I. M., A., Sultan, Muljono, A., B., 2012, “Rancang Bangun Perangkat Lunak Untuk Evaluasi Studi Aliran Daya Tiga Fase Dengan Metoda Kompensasi”, laporan penelitian dana DIPA BLU, Universitas Mataram. 3. Grainger, J.J., dan Stevenson W.D.Jr., 1994, ”Power Sistem Analysis”, McGraw-Hill, Inc., Singapore. 4. Saadat, H., 1999, “Power System Analysis”, McGraw-Hill, Singapore. 5. Articles from journals of the last 5 years on power system analysis.	