Subject TItle:	Loadflow in electrical power system, Subject of Programming in Power System Engineering.
Subject Code:	
Eligible Student Year:	Fourth
Year/Semester:	2015, Semester 1
Credit:	2
Periods/Week (Avg) Total:	2
P/W Lecture	0.75
P/W Tutoring	0.5
P/W Practice	0.75
Lecturer(s):	DR.Glanny Mangindaan & ¦Alwin Sambul,PhD & Hans¦DR.Steven Sentinuwo & D¦Arie Lumenta.MT & Pinro
Compulsory/Elective:	
Department:	Electrical & Informatics

Course Goals	Load flow or power flow study is determines system voltage profile and power losses. Scope of load flow is intersection of generation side , load side , and power system operation side. It need numerical computation to reach a solution.
Outline	In current days, speed of load power growth increase rapidly then it needs large highly interconnected network, power generation sets and operation system which it can be run integrable and harmony. Extensive system studies are required at almost all stages of its planning, operation and control. Simulation and analysis of such a large system is possible only with the help of digital computers. Most of the time, a power system and load flow, theoretically, remains under steady state. Load flow or power flow study is the most frequently carried out steady state analysis, which determines system voltage profile and line flows/losses. The ever growing concern towards secure operation of power systems requires security analysis to be carried out at planning as well as operation stage. Load-flow is important in determining the short circuit levels, which is utilized in proper selection of equipments and determining the protection requirements. This course will cover review theory of AC power flow in linear network, the modeling issues, and some numerical approach to solve non-linear equation for the power flow. Necessary details of numerical computation to solve divergency problem as well as and handling of some experiments using simple application will also be included.
Keywords of Subject	Modeling of power system components: phasor, per-unit-system, Y-bus matrix. Iteration and elimination method, power flow equation.
Enrollment Prerequisities	Programming , numerical method
Assessment Methods	Evaluation is based on method of team based learnnig methodologies. So evaluation can divided from team lecturer and a teacher who is as a supervisor of this class. Weight of each part 50% and total of both points are sumed up then the final evaluation will be given based on the usual evaluation grade: minimum points to get the credit is 55 points.

Textbooks/Materials	1. Prabha Kundur, Power system stability & control, http://www.amazon.com/System-Stability-Control-Prabha-Kundur/dp/007035958X 2. Carlson Taylor, Power system voltage stability, http://www.amazon.com/Stability-Electric-Research-Institute-Engineering/dp/0070631840/ref=sr_1_1?s=books&ie=UTF8&qid=1435384373&sr=1-1&keywords=voltage+stability%2C+Taylor
Reading and Resource Lists	1. AC Power flow in linear networks. http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-061-introduction-to-electric-power-systems-spring-2011/readings/MIT6_061S11_ch2.pdf 2. Introduction to load-flow. http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-061-introduction-to-electric-power-systems-spring-2011/readings/MIT6_061S11_ch5.pdf
Contact Information of Lecturer(s)	odikaunang@yahoo.com
Messages from Lecturer(s)	Necessary course : Electric circuit , Numeric method . Preferable course : Power system analysis. Other comments : students can contact team member and lecturer by moodle's wall or email.

DETAILED CLASSES

Week/Date of Class	Theme of Class	Topics of Lecture	Topics of Tutoring	Topics of Practice
Averate Periods/Week	2	0.75	0.5	0.75
September 2015, 2nd week	Modul 1 : Overview theory of AC power flow in linear network.	per-unit-system , polyphaseline & single phase equivalent , Normalization of voltage & current , Three phase system , Transforming from one base to another	Question and anwer via moodle's wall.	question & answer
September 2015, third week	Modul 2 : Load flow theory	Complex number & phasor , Sinusoidal time function , System function & frequency response , Energy & power , A conservation law , Power flow through an impedance , Transmission & compensated line.	Question and answer via Moodle's wall	Exercise some example
September 2015, fourth week. It needs two times meeting.	Modul 3 : Numerical method	Convergency Divergency , iteration method Gauss-Seidel , elimination method Newton-Raphson	Exercises sample cases, question and answer.	exercise some example

October 2015, second and third week	Modul 4 : Modelling	Modelling of power system component , Power flow equation , Formation of Y bus matrix , Power flow solution algorithm.	Exercise sample case	Problem solving
October 2015, third week	Modul 5 : Experiments 1	Moodle, VPL-Virtual Programming Lab, PSAT	Installing & user guide	Exercise for various data input based on iteration method
October 2015, fourth week	Modul 6 : Experiments 2	Moodle, VPL-Virtual Programming Lab, PSAT	User guide	Exercise for various data input based on elimination method
November 2015,	Lab based learning by team	Moodle, Virtual Programming Lab	Question & answer via e-learning	Lab based learning, tune another convergency situation then to be attentioned about amount of iteration and time execution.
December 2015,	Compilation and evaluation	Identification of future works	Discussion and questioneries	Documentation and make some notes of conclusion