Faculty of Engineering & Technology

Power System Analysis 2

Information :

Course Code :	EPR 512	**Level**	**:** Undergraduate	**Course Hours :**	3.00- Hours

Department :	Specialization of Electrical Power Engineering

Instructor Information :

Title	Name	Office hours
Professor	Said Fouad Mohamed Mekhemar	2
Assistant Lecturer	Mohamed Abdallah Mahmoud Shaheen	4

Area Of Study :

Upon successful completion of the course, the student should be able to:
1- Demonstrate understanding of the power system at normal operation.
2- Understand the basic concepts of the power system voltage stability (VS).
3- Assess VS indices and estimate the required corrective measure.
4- Solve small disturbance stability problems.
5- Solve large disturbance stability problems.
6- Understand the equal area criterion to predict the stability condition.
7- Use the numerical solution method to solve the swing equation.

Course outcomes :

a.Knowledge and Understanding: :

1 -	Demonstrate knowledge and understanding of components and concepts of power systems.
2 -	Illustrate and describe solving techniques of power systems.
3 -	Illustrate and describe theorems for solving power systems.

b.Intellectual Skills: :

1 -	Express ideas in structural and mathematical terms so that quantities evaluation is facilitated.
2 -	Ability to apply different alternative solutions.
3 -	Decide and choose among different solution alternatives.
4 -	Evaluate obtained results both individually or as a part of team.

c.Professional and Practical Skills: :

1 -	Testing electrical components.
2 -	Implementation for simple power systems.
3 -	Applying solution techniques on simple power systems in the lab.

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d.General and Transferable Skills: :

1 -	Write technical reports in accordance with standard scientific guidelines.
2 -	Work in a self-directed manner.
3 -	Work coherently and successfully as a part of a team in the Lab.
4 -	Analyze problems and use innovative thinking in their solution.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction, Power System Modeling at normal operation	6	3	3
Voltage stability: concepts, assessment indices, counter measures & case study	24	12	12
Power system stability: basic concepts, swing equation, machine models	12	6	6
Steady state stability, small disturbance,	12	6	6
Transient stability (TS)- large disturbance, equal area criterion,	18	9	9
Introduction to numerical solution, TS enhancement methods	6	3	3

Teaching And Learning Methodologies :

Lectures
Tutorials
Laboratories

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignment and Quizzes (1)	10.00	5	to assess the skills of problem solving, understanding of related topics.
Assignment and Quizzes (2)	10.00	9	to assess the skills of problem solving, understanding of related topics.
Attendance	10.00		to assess the performance of students during the course
Final Exam	40.00	15	to assess the comprehensive understanding of the scientific background of the course, to assess the ability of problem solving with different techniques studied.
First Mid-Term Exam	15.00	7	to assess the skills of problem solving, understanding of related topics.
Second Mid-Term Exam	15.00	11	to assess the skills of problem solving, understanding of related topics.

Course Notes :

No course notes are required

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Recommended books :

Hadi Saadat, "Power System Analysis", McGraw-Hill, 2nd edition, 2004
6.3- Recommended books

J. D. Glover, M. S. Sarma and T. J. Overbye, "Power System analysis and Design", Cengage Learning, USA, 5th Edition, 2012

J. J. Grainger and W. D. Stevenson, Jr., "power system analysis", McGraw-Hill, Int. editions 1994.

P. Kundur, "Power system stability and control", McGraw-Hill, Int. editions 1994.