



Academic Quality Assurance Department

Course Syllabus Form

College	Faculty of graduated studies		
Program	Smart grid Engineering		
Course Title	Protection systems in Smart grid	Course Number:	17141208
Year	2022/2023	Semester:	First
Elective/compulsory	Compulsory		
Prerequisite(s)			
Instructor	Dr.Mohammad Dreidy		
Instructor's e-mail	m.dridi@ptuk.edu.ps		
Office Hours	Sun,Mon,Tue 10-11		
Class Time	Sun 14:00-17:00	Class Room:	H215
Course description	<p>This course provides overview of Power System and Power System Protection Calculations; Symmetrical Component Methods; Use of Software Programs For Fault Calculations; Protection Technologies; Instrument Transformers; Circuit Breakers; Protection of Power Transformers; Protection of Power Systems with High Degree of Renewable Energy Sources; Directional relays; Distance relays; Differential Relay; Protection of HVDC Networks; Protection of Power Cables and Lines; Protection of Substations; Protection of Motors; Protection of Generators; Frequency and Voltage Protection; Special Protection Functions; Testing of Power System Protections; Trends in Power System Protection; Protective Relaying; Static and Digital Relays; Failure Investigations; Protection Issues for Micro-Grids; Digital Protection of Smart Grid Systems;</p>		
Course objectives	<ol style="list-style-type: none"> 1- Understanding of different protection systems like generation protection transformer protection, transmission line protection 2- Understanding the modern power system protection and the effect of distribution generation 3- Realize the new protection trends which will be available in future smart grid 4- Study the reliability and stability of smart grid 		
Textbook(s)	<ol style="list-style-type: none"> 1- Modern Solutions for Protection, Control and Monitoring of Electric Power Systems-Quality Books, Inc. (2010),Hector J. Altuve Ferrer, Edmund O. Schweitzer III 2- Electric power distribution, automation, protection, and control -CRC Press (2007),James A. Momoh 3- IEEE Journals 		
Other required material (References):	<ol style="list-style-type: none"> 1- Power system protection (1999), P. M. Anderson 2- Power system stability and control 1994, Prabha Kundur 		



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Other Resources used (e.g. e-learning, field visits, periodicals, software, etc.)	Shared Videos via MOODLE
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Assessment Type	Weight	Date(s)
Midterm Exam	30	
Quizzes	30	
Laboratory/Practical		
Assignments		
Project		
Final Exam	40	
Total	100%	

Week	Topics Covered
1	Course introduction, traditional and modern power system
2	Discuss the different types and classifications of fault, Basic concepts of protection devices; protection zones, directional protection,
3	Type of Protection relays, circuit breaker,
4	Selectivity, discrimination
5	Symmetrical fault current calculations; PU method, VA method
6	Fuse types and fuse coordination, Distance protection, differential protection
7	Transformer protection, voltage and frequency regulation
8	Looking to protection future, time synchronized systems
9	Distribution system protection automation and control
10	Wide area protection
11	Introduction to power system stability
12	HVDC operation control, responses to dc and ac faults
13	Small signal stability, transient stability
14	Midterm and longterm stability, Methods of improving stability

Prepared by:	Dr.Mohammad Dreidy	Signature	
Head of Department		Signature	
Date	24/9/2022		



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تاريخ الإصدار: 2019/5/12

رقم الإصدار: (1/0)

رمز الوثيقة: د.ج.أ- إ.ب.خ-ن02