Cairo University, Faculty of Engineering			
Mapping Course LOs to NARS			
Course Title :		**Applied Control Technologies for Energy Systems**	
Course Code :		**MEPN 405**	
Instructor Name :		**Associate Professor Mohsen Sayed soliman**	
Program(s) that offer the course :		**SEE (Sustainable Energy Engineering)**	
Course LOs On successful completion of the course, students will be able to		**Select NARS competencies statements (numbers) that each LO satisifes well from 2 categories**	
		Competencies for Engineering Graduates	**Competencies for Engineering Specializations**
1	Recognize and identify different types of automatic control systems and control loops.	**1- Identify complex engineering problems**	
2	Understand basic concepts and definitions of classical control theory.	**10. Acquire and apply new knowledge;**	
3	Apply mathematical modeling analysis of control systems and use block diagram presentation.	**2- Develop appropriate simulation, analyze and interpret data,**	
4	Use Laplace transforms technique to solve the Objective Transfer Function of Control System.	**1-Formulate, and solve complex engineering problems by applying engineering fundamentals by applying basic science and mathematics.**	
5	Find instantaneous time-response of control systems and examine its graphical presentation.	**2-Develop and conduct appropriate simulation, analyze and interpret data, assess and evaluate findings,**	
6	Understand frequency response of control system and investigate the Bode Diagram Plots.	**10. Acquire and apply new knowledge;**	
7	Recognize various applications of Virtual Lab Techniques to study automatic control systems.		**2.3 Select conventional mechanical equipment according to the required performance.**
8	Apply educational Virtual Lab to understand basics and essentials of Hydraulic control systems.		**2.1 Model, analyze and design physical systems applicable to the specific discipline**
9	Investigate various components, parts and accessories of Hydraulic Circuits.		**2.2 Plan, manage and carry out designs of mechanical systems**
10	Understand hydraulic symbols and schematics used for drawing hydraulic circuits.		**2.4 Adopt suitable national and international standards and codes;**
11	Practice reading symbol-schematics of hydraulic circuits.		**2.4 Adopt suitable national and international standards and codes;**
12	Perform function analysis to select proper parts for circuits with optimum performance.		**2.3 Select conventional mechanical equipment according to the required**