



Electrical Energy Engineering Program

**Faculty of Engineering
Cairo University**

June 2014

Electrical Energy Engineering: A field Ripe for Opportunities

- ❖ **Energy Security and climate change.**
- ❖ **Aging of the Power system combined with advancements in all other fields.**
- ❖ **Lack of Expertise in renewable energy and innovative smart grid solutions.**
- ❖ **Each 1 GWH increase produces 0.11 job-year (World Bank). In 5 years, it is expected that 4840 job opportunities will be generated and 14740 jobs in 10 years.**

Educational Objectives

- ❖ Offers fundamental knowledge.
- ❖ Enables work in regional and international markets.
- ❖ Develop communication, teamwork, and professional skills.
- ❖ Promote hands-on experience.
- ❖ Expose students to some important areas and integrate courses from many different disciplines, for students to develop the expertise needed to reshape how the world uses energy

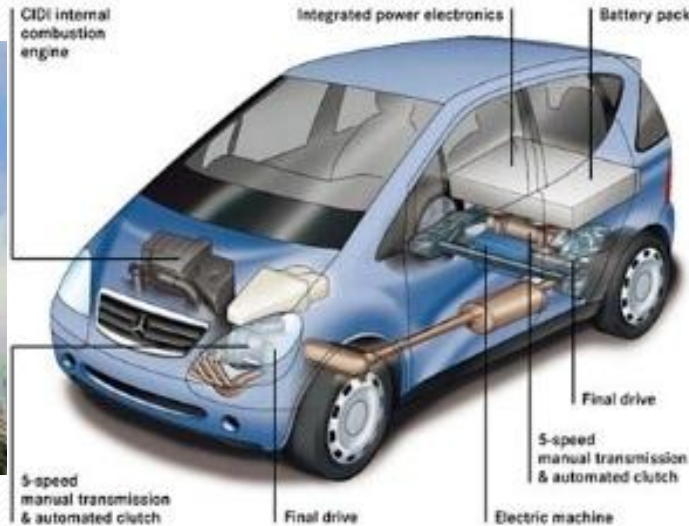
Philosophy of Curriculum

1. Structured during the first four semesters.
2. Flexible during the upper six semesters.
3. Elective courses during the senior years.
4. Laboratory-based curriculum combines hands-on practice with the appropriate basic electrical and electronics theories.
5. Tailored to international standards
6. Serves direct market needs
7. Meets criteria of international accreditation.

SOME APPLICATIONS RELATED TO EEE PROGRAM CURRICULUM



MAGLEV Monorails



Hybrid Vehicles

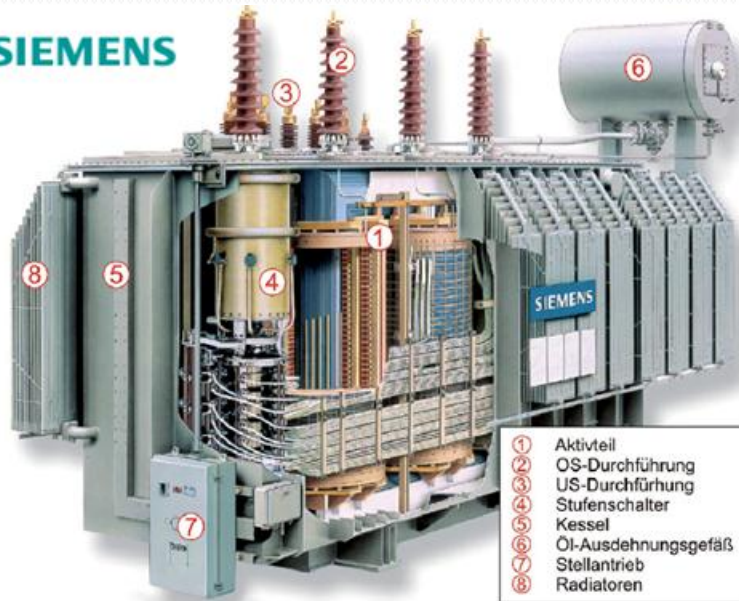


Wind



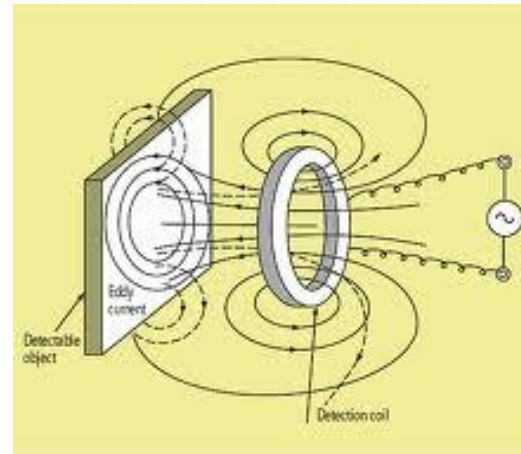
Induction Heating⁵

SIEMENS



- ① Aktivteil
- ② OS-Durchführung
- ③ US-Durchführung
- ④ Stufenschalter
- ⑤ Kessel
- ⑥ Öl-Ausdehnungsgefäß
- ⑦ Stellantrieb
- ⑧ Radiatoren

Transformer Design



1. An oscillator and a detector coil generate a magnetic field that produces Eddy currents in a nearby metallic object (the detectable object). These Eddy currents generate a magnetic field that influences the field produced by the sensor's detection coil.

Proximity Sensors

SOME APPLICATIONS RELATED TO EEE PROGRAM CURRICULUM



PV Panels



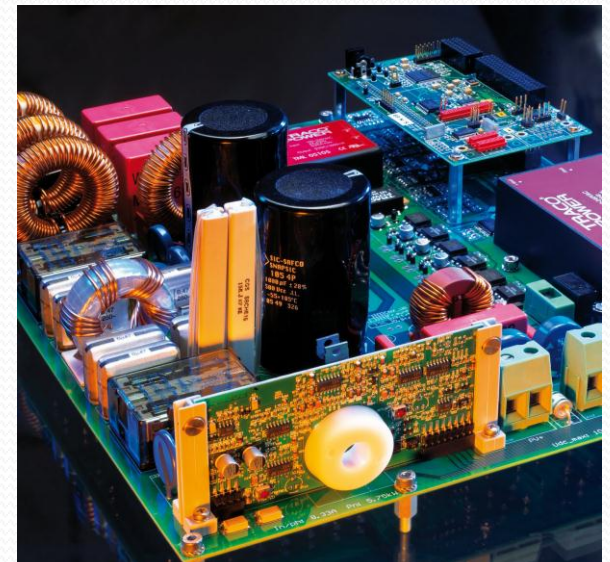
Industrial Automation



Efficiency



Smart grids

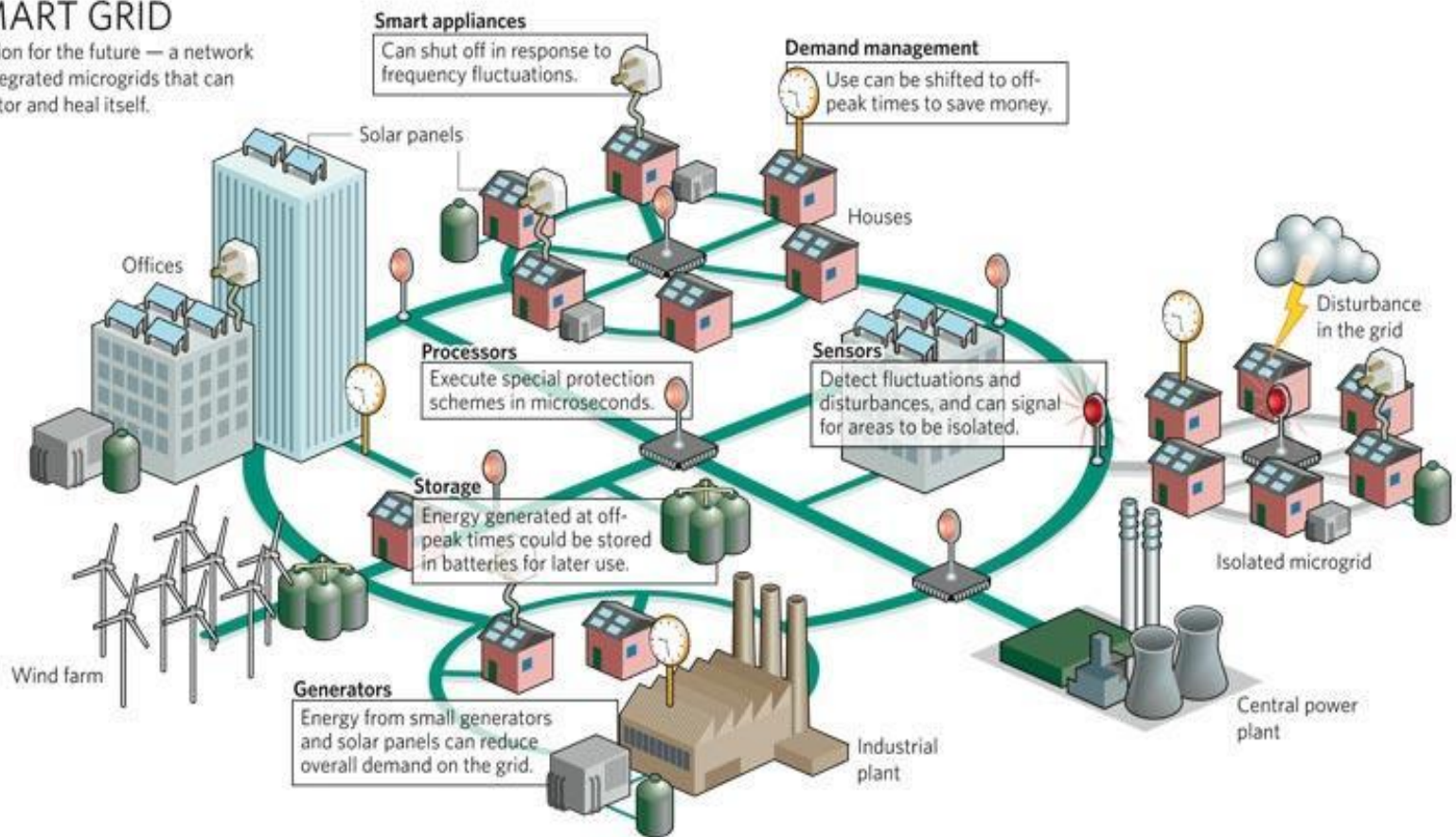


Power electronics

Renewable Energy and Smart grids applications

SMART GRID

A vision for the future — a network of integrated microgrids that can monitor and heal itself.



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