

Mechanical Engineering Courses (ME)

ME 425 – Power Plant Technology

Hour: Lecture: 2 Hrs. Tutorial: 2 Hrs. Credit: 3.

Coordinator: Sameh Shabaan

Text Book:

- M.M El-wakil, "power plant Technology" (1984), McGraw-Hill, 1st edition.

Reference Books:

- H. Cohen, G.f. C Rogers, and H. I. H. Sararanamutto, " Gas Turbine Theory" (1987), Longman scientific and Technical, 3rd edition.
- Kam w. Li, and Paul Priddy "Power Plant system Design "C 1985), John Wiley and Sons, 1st edition.

Specific course information

- a. Thermodynamics Re view (1st, 2nd laws of thermodynamics) –Steam formation-steam Properties and process – simple Rankin cycle- Modified Rankin Cycle – Reheat and Regeneration cycle - Power Plant control – simple Gas Turbine cycle - steam Turbine, steam Generator and steam Condenser –Gas Turbine cycle with Reheat, Inter Cooling and Regeneration –Combined cycle Power plant –Nuclear Power plant – Renewable Power Generation, Solar energy- wind Energy – Geo thermal Energy.
- b. Prerequisite: ME 424 – ME 333
- c. Designation: Selected Elective

Specific goals for the course:

- Ability to visualize the impact of the Mechanical technological development on the environment
- An ability to use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice
- An ability to identify, formulate, and solve engineering problems.

Course instruction outcomes:

- The students will develop capabilities to thoroughly understand the performance of the different thermal plants, Evaluate this performance, compare and choose between them.

Topics Covered:

- Thermodynamics Review (1st, 2nd laws).
- Steam Formation.
- Steam Properties and Process.

- Simple Rankne Cycle.
- Modified Rankine cycle.
- Reheat and Regeneration Cycles.
- Steam Turbine, steam Generator and steam condenser.
- Power Plant control.
- Simple Gas Turbine Cycle.
- Gas Turbine Cycle with Reheat, In for cooling and Regeneration.
- Combined Cycle Power Plant.
- Nuclear Power plant.
- Renewable Power Generation, Solar Energy.
- Wind Energy.
- Geo thermal Energy.

Course / credit hours	Math & Basic Sciences	Engineering Topics	General Education
Power plant operation &management (ME523)/3		3	