

# NUCLEAR POWER ENGINEERING

## NPRE 402

<http://www.mragheb.com>

Summer 2016

3 hours or 1 unit

### Outline

Principles of release and utilization of fission and fusion energy in nuclear, plasma and radiological engineering, including topics such as: radioactivity, nuclear reactions, interaction of radiation with matter, fission processes, controlled chain reactions, radiological health science, fission and fusion reactor types, design principles and operational characteristics, power reactor design criteria, radiation protection and instrumentation, nuclear fuel cycle, waste treatment, and other applications such as propulsion, desalination, space power and research reactors.

### Recommended reading:

1. M. Ragheb, "Nuclear, Plasma, and Radiation Science, Inventing the Future," Univ. of Illinois at Urbana-Champaign, 2014.

### Instructor:

Prof. M. Ragheb

O: (217)333-6569

Classes: MWF 10-12 am

Office: MW 12-1 pm

Prerequisite: advanced calculus, consent of instructor

### Tests, Grades:

Two midterms and one final exam: 60 percent

Homeworks, quizzes, projects: 40 percent

To obtain a full 1-unit credit, Graduate Students are expected to present a term paper or project on an advanced topic related to the course.