

**PHYSICS 374: WEAPONS OF MASS DESTRUCTION
EXAM #1 STUDY GUIDE**

- Who were the following individuals and what did they contribute to nuclear physics?
 1. Albert Einstein
 2. Enrico Fermi
 3. Marie Curie

- What are:
 1. atomic number
 2. atomic weight
 3. atomic mass
 4. molar mass

- What is an isotope?

- How can you determine the number of alpha decays in a decay chain?

- How can you determine the number of beta decays in a decay chain?

- What is a gamma ray / gamma radiation?

- What is an alpha particle? What happens during an alpha decay?

- What is a beta particle? What happens during a beta decay?

- What were the original models of the atom?

- What is critical mass?

- What is subcritical mass?

- What is supercritical mass?

- What is Avogadro's number?

- What are several methods for uranium enrichment?

- What is yellowcake?

- What is the percent breakdown of uranium isotopes in:
 1. Natural uranium
 2. Depleted uranium

3. Low-enriched uranium
4. Highly-enriched uranium
5. Weapons grade uranium

- In what year was uranium fission first achieved?
- In what country was uranium fission first achieved?
- Which country has the world's largest uranium ore deposits?
- What are fissile isotopes? What are the most commonly used for nuclear energy and weapons?
- What is the half-life of an isotope?
- What is activity rate, and in what units is it measured?
- What is the difference between dosage and exposure? What are the units of each?
- What is a REM, and how does it compare to a rad?
- How do you calculate decay energy?
- How do you calculate fission energy?