

PHYSICS 374: WEAPONS OF MASS DESTRUCTION
Test #2 Study Guide

- What is the Manhattan Project?
- Who led the Manhattan Project?
- What are the current nuclear states? (nuclear armed countries)
- How are nuclear bombs and thermonuclear (hydrogen) bombs different?
- What are the two main fissile fuels used in nuclear weapons?
- What methods are used to achieve supercriticality in a fissile core? Do these both work for each type of fuel?
- How can you increase yield in a fission bomb?
- What are the stages of a nuclear explosion, starting from the chain reaction?
- What are the factors that contribute to the formation of the mushroom cloud?
- What is overpressure? Why is 5-psi a “special” value?
- How do you calculate casualty estimates?
- What are the classifications of nuclear explosions (based on where they explode)?
- What is the Mach effect / Mach stem?
- What is cube-root scaling?
- What is the blast radius?
- What is optimal burst height?
- How (what units) is radiant exposure measured?
- What is the burn radius?
- How are thermal effects different for nuclear and thermonuclear explosions?
- What are the different types of burns inflicted by nuclear explosions?
- What are the different types of radiation released from a nuclear explosion?
- How are they classified according to time-after-detonation? Why is 1 minute after detonation important?

- Why do gamma ray effects for higher yield thermonuclear explosions extend further than one might expect? (curling!)
- What is typical background radiation exposure?
- What do LD-50 and LD-100 mean?
- How is the energy released from a nuclear explosion distributed into its different effects? What are those different effects?
- How does the size of the burn area vary with yield and optimal burst height?
- How does the size of the LD-50/LD-100 area vary with yield and optimal burst height?
- What is neutron activation?
- What is fallout?
- What is the rule of 7-10?
- What are typical fallout isotopes? Why are they long-term hazards?
- What is half-thickness?